PEMBERTON

ON

CANCER.


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CLINICAL ILLUSTRATIONS

OF

VARIOUS FORMS OF CANCER.

CLINICAL ILLUSTRATIONS

OF VARIOUS FORMS OF

CANCER,

AND OF OTHER DISEASES LIKELY TO BE MISTAKEN FOR THEM,

WITH ESPECIAL REFERENCE TO

THEIR SURGICAL TREATMENT.

BY

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THIS VOLUME

IS

DEDICATED

TO

JAMES PAGET, F.R.S.;

SURGEON TO ST. BARTHOLOMEW'S HOSPITAL, AND SURGEON-EXTRAORDINARY TO THE QUEEN,

IN TESTIMONY OF THE ADMIRATION AND AFFECTION ENTERTAINED FOR HIM

BY THE AUTHOR.

PREFACE.

THE design of this work is correctly expressed by its title.

It is simply a record of a very considerable number of the cases of malignant disease that have fallen under my own observation during the labours of many years, preceded by a brief account of the symptoms of the particular form of disease to which they relate, and accompanied by such clinical comments as my experience has suggested. I have, consequently, omitted all reference to the writings of others, and all controversial matters.

It is far more useful, in my judgment, for individual surgeons to set forth the results of their own experience and observation, than it is to produce more ambitious and extensive treatises filled with references to the opinions and writings of other observers.

I am quite aware that my work would have been much more valuable and precise if I had had the time and skill to prosecute careful microscopical examinations in every case. But circumstances—which all those who are engaged in extensive practice will know how to appreciate—have rendered this impossible, and I have been obliged to content myself with such lights as the ordinary means of investigation afford; and, after all, it is to these alone that the surgeon must trust in the exigencies of actual practice.

The drawings for the plates and wood engravings have, in every instance, been made under my own guidance, from recent dissections which I have myself prepared.

I have much pleasure in acknowledging the courtesy with which my colleagues—Mr. Crompton, Mr. Baker, and Mr. Bolton—have permitted me to make use of many important cases that have from time to time been admitted under their care in the Hospital.

Temple Row, Birmingham,
October, 1867.

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CHAPTER I.

THE CHARACTERS DISTINGUISHING MALIGNANT FROM BENIGN GROWTHS.

THE various growths and tumours which fall under the observation of the surgeon may be naturally arranged in two large groups, which may be termed respectively the malignant and the benign.

There is no one character which is essential and always to be met with in either of these groups. On the contrary, almost all the characters of the one group may be, and frequently are, met with either severally or collectively in the other.

Nevertheless, the individuals composing each group may nearly always be identified either by the presence of a certain series of characters which, as that series, are never met with in the other groups, or by the degree in which one or all the characters composing the series are present.

The difference between these two groups of tumours, it will be observed, is founded on their mode of origin and growth—on their mode of generation and decay—on the constitutional peculiarities and vital conditions immediately preceding, accompanying, or following their manifestation, rather than on any considerations as to their intimate structure—on the whole life of the tumour, rather than on any one incident connected therewith.

The accurate determination, then, on the part of the surgeon, of the group to which any tumour belongs, is of the deepest importance both as to the prognosis and appropriate treatment of it.

The distinctive characters of each of these groups are as follows:

The malignant tumours almost always infiltrate the part or tissue that they attack: the natural characters of the structure being either absorbed or otherwise destroyed, and replaced by new material.

The benign tumours generally form distinct masses in the substance or between the textures of the part or organ affected by them. The tissues may be absorbed to a certain extent by pressure, or wasted by imperfect or mal-nutrition, but they are not destroyed by the encroachment of a new material.

The malignant tumours possess an almost inevitable tendency to soften and ulcerate. This softening almost always, yet not invariably, precedes their ulceration. It sometimes results from degeneration of a part of the morbid growth; sometimes, perhaps less frequently, it arises from inflammation attacking it. The malignant ulcer when once established is ever spreading, it widens in circumference and grows in depth, it passes with fatal rapidity through any substance or

tissue beneath or around it. Fascia and muscle—tendon, cartilage, and bone—are alike powerless to arrest its onward march. As it advances, its margin and base become infiltrated with a similar material to that constituting the original growth, and the matter so infiltrated passes through the same stages as the original growth has done previously.

In the benign tumours, on the other hand, there is little or no tendency to soften. When the ulcerative process takes place in them it is generally accidental—connected either with their rapid growth or with some injury. They have no inevitable tendency to it, nor is it the natural mode whereby their destruction is accomplished. When it does occur it is neither so rapid in its progress nor so destructive in its effects as in the case of malignant ulcers. It passes with difficulty through new tissues. There appears to be a tendency—weak, though ever abiding—to limit the disease and repair the waste. Moreover, neither the margins nor the bases of these ulcers are ever infiltrated with any material other than ordinary plastic lymph.

The malignant growths have a great tendency to multiply, not merely in the tissues immediately surrounding the original growth, but in other and remote parts of the body, affecting various tissues and many organs. Gland and muscle, skin and bone, connective tissue or membrane, may be, and indeed frequently are, affected in any one case—the disease appearing not contemporaneously in all of them, though perhaps it is so in some, but still always being successive as to the majority of them.

In the benign tumours, on the other hand, there is little liability to this multiplication—to this growth of similar tumours around the original ones, still less tendency is there to the affection of remote parts. Never, or almost never, do similar growths show themselves in different tissues or in various organs. If similar tumours do manifest themselves in other parts of the body, their appearance is almost invariably observed in similar tissues, and their development is simultaneous, or nearly so, with that of the original disease. That succession of tumours of the malignant type, which only ends in death, is here unknown.

In malignant tumours the secondary growths are not always, nor indeed commonly, of the same species as the original ones.

In the benign group the recurring growths are always of the same kind as the primary one. Enchondroma repeats itself as enchondroma—exostosis as exostosis, and so of the rest. There are some apparent but no real exceptions to this rule.

The malignant tumours are almost certain to reappear after removal, either in or around the cicatrix, or in some more distant part. The rapidity of this appearance depends, in each tumour, in some degree on its kind, but in a still greater degree on circumstances which are, as yet, unknown.

The benign tumours, as a group, are but little liable to reappear when they are removed, but some few of them, known as recurrent tumours, have this tendency in a more marked but still in a very slight degree. They form, as it were, a border group—a connecting link, in this regard—between the malignant tumours and the benign.

The malignant tumours, after their first appearance, are almost certainly, and often very rapidly, followed by a similar affection in the lymphatic glands connected with the part or organ in which the tumour is located. In some cases the glands so affected, themselves form large tumours—growths not unfrequently far surpassing in extent the dimensions of the original disease whose tendency to soften and ulcerate they closely follow; thus forming secondary foci from which the system may be contaminated or the disease diffused.

The benign group show little or no tendency to the production of glandular affections. It is probable, indeed, that the glands adjacent to an innocent tumour never become affected with the same disease. They become in some cases tender and enlarged; but this is in all likelihood to be attributed to irritation, or inflammation caused by the absorption of the products of the degeneration and decay of the original tumour.

The malignant growths are very frequently preceded—more frequently still, accompanied—from an early period of their development by a certain series and combination of symptoms known by the name of cachexia, and which, when present, is eminently characteristic of them. The benign growths are never so preceded or accompanied. Both groups are, however, attended by a similar set of symptoms—but still more intense in their manifestations—known as secondary cachexia. This continues as long as the disease progresses. It often disappears with its removal, but only to reappear with increased energy as soon as the disease recurs. This secondary cachexia, it must be remembered, is almost constant in the malignant diseases—inconstant, even rare, in the benignant ones.

The malignant tumours, as a rule, bear but little resemblance, as regards their intimate structure, to any of the natural tissues of the body. The large majority of them contain cells formed on the type of the gland cells or of epithelial cells, but assuming the most various and irregular shapes, and arranged without any definite plan or order, unlike the cells composing any of the natural tissues.

The benign tumours, on the other hand, resemble almost exactly in their structure some of the natural tissues of the body—the adipose, the fibrous, the cartilaginous, and the osseous tissues affording frequent illustrations of the materials of which they are constructed.

The group of malignant tumours possessing either all or a certain series of the characters above described are also known as cancers. The terms malignant disease and cancer are synonymous, and in all respects coextensive.

CHAPTER II.

THE CHARACTERS OF THE SPECIES AND VARIETIES OF MALIGNANT GROWTHS.

IN the preceding chapter I have endeavoured to describe the characters whereby the malignant group of tumours and their kindred growths may be distinguished from the benign group or class. In other words, I have described the characters of the genus cancer.

I now propose to describe the anatomical peculiarities of the different forms of this disease—forms which may properly be termed species, inasmuch as each of them has a distinct clinical history.

In addition to the anatomical characters peculiar to it, I shall also describe such varieties of each species as may seem to demand a special notice.

The distinctions between the varieties, it will be observed, are founded on material points of far less importance than those characterizing the species; their clinical history, moreover, will be found to be identical with that of the species to which they belong.

I must first remark that the various species of cancer can only be distinguished from each other with certainty in the best marked or typical specimens. In the majority of growths we shall find that the features assumed to be distinctive gradually shade off and merge into those of some other species, so that it becomes a matter of difficulty to determine to which type the characters of a given specimen bear the greatest resemblance. Indeed, in some instances a tumour or growth may be referred to either of two species with equal accuracy.

The characters of the cancerous tumours which I am about to depict, belong to them when free from the remains of any of the natural tissues of the part or organ affected by them.

The first species which I shall describe is termed scirrhus.

It is characterized by extreme hardness and inelasticity. It is generally of small size, seldom larger than an orange—almost always infiltrated, but sometimes occurring as a distinct tumour—never in this latter case being surrounded by a true cyst. On section, the tumour on each side of the cut surface becomes distinctly concave—the appearance thus presented is readily observed and must be regarded as a very marked peculiarity, and, as such, eminently suggestive of the true nature of these tumours.

The cut surface has a pale or silvery grey colour, sometimes verging on a cloudy blue. The surface is smooth and glistening and is generally homogeneous, having no distinct fibrous or other arrangement. It is more or less vascular according to circumstances and situation. The cut surface is often variously intermingled with masses of colloid material or of extravasated blood,

or with variously coloured masses arising from the degeneration of portions of its substance. These are generally of a more or less deep yellow colour, and vary in size from mere points to considerable masses, which bear some rememblance to deposits of tuberculous matter.

On microscopical examination, scirrhus is found to consist of cells—free nuclei—and an intercellular substance.

The cells of scirrhus cancer are characterized by the extreme variety of their shape. They may be oval, more or less round, pyriform, reniform, or variously caudate. They bear more resemblance to gland cells than to any other. Their cell wall is very delicate and they vary much in size, the medium probably being about $\frac{1}{1200}$ of an inch. They generally contain but one nucleus, sometimes two, rarely more than that number.

The nuclei are much more characteristic of scirrhus cancer than the cells are. They are of large size, varying about the $\frac{1}{2500}$ of an inch. They are very uniform in shape, and are nearly round; they are well defined and clear, and are further especially remarkable by the great size and distinctness of their nucleoli. Each cell, in general, contains but one nucleolus, but there may be two and, occasionally, even three.

Free nuclei are almost always met with in scirrhus tumours, and these exactly resemble, in every particular, those contained within the cells.

The intercellular substance appears to vary considerably in firmness and tenacity in different specimens; it is homogeneous in structure, and fills up the interstices between the free cells and nuclei.

The only variety of scirrhus that I shall describe may be called acute scirrhus. It is characterized by its much greater softness and vascularity, and by the circumstance of its much more frequently appearing as a distinct tumour. Its cut surfaces seldom present spots or patches of degeneration, and they have a much less tendency to contract or become concave.

These characters are due entirely to its more rapid growth, and in this respect it forms the connecting link between the scirrhus and medullary tumour, the history of which I shall next endeavour to narrate.

The medullary or encephaloid species of cancer may occur either as a distinct tumour, or it may be infiltrated into the tissues of any part or organ.

These two forms are met with in almost equal numbers.

The tumours grow to a very much larger size than those of scirrhus, and they are very soft to the touch, communicating to the fingers a sensation similar to that produced by the fluctuation of some thick liquid.

They are frequently surrounded by a distinct capsule, prolongations from which intersect the tumour and divide it into lobes.

On section, the substance of the tumour is found to be extremely soft, often almost pulpy—in the majority of cases not firmer than brain substance, and easily broken up by very slight pressure.

Their colour is either opaque white, or greyish, or pink, or any or all of these colours are present in various parts of the section.

Small masses of yellow substance, arising from the degeneration of the encephaloid structure, are often found scattered over the section, together with small clots of blood or of colloid matter.

These growths when subjected to slight pressure yield a milky fluid in large quantity, which is termed cancer juice. This is readily miscible with water rendering it turbid, and it is very characteristic of the species of cancer I am now describing.

When all the expressible matter is squeezed out there remains a small quantity of a light flocculent tissue intermingled with a large quantity of blood-vessels; this tissue is termed the stroma of the cancer.

The majority of these tumours are extremely vascular, the smaller vessels being of disproportionately large size; they have, moreover, very thin walls and but little contractile power.

They are sometimes so numerous that the tumour bears a great resemblance to an erectile tumour, and under certain circumstances these tumours have a distinct pulsation like that of an aneurism, from which, indeed, it is by no means easy to distinguish them.

Medullary growths, connected with bone, frequently contain either long spicula or flat plates of bone in their interior. These often intersect the growth in every direction, proceeding from the bone towards the surface, but never reaching the latter.

The medullary tumours are composed of nucleated cells, free nuclei, intercellular substance, and stroma.

The nucleated cells are not distinguishable from those met with in scirrhus growths. The same remarkable variety of forms is met with, even in a greater degree than in scirrhus tumours, but the elongated caudate variety appears to predominate; the nuclei are also similar to those of scirrhus.

Some of the softer medullary tumours are composed entirely of free nuclei embedded in a soft semifluid intercellular substance.

Free nuclei are met with in some tumours larger than the average size; others of these are elongated, or pyriform, or caudate.

The intercellular substance in medullary cancers is more abundant than it is in scirrhus; it is also much softer, and occasionally even liquid.

The stroma of medullary growths varies very much according to their firmness or softness. In general it consists of a delicate, pellucid, nucleated membrane, intersecting the growth in all directions, and forming a framework for it.

The varieties of the medullary or encephaloid species of cancer are three: the firm; the melanotic; and the cystic.

The firm variety is, as its name implies, harder and more elastic than the typical form. The cut surface appears more compact and glistening. It is almost identical in appearance with the soft variety of scirrhus cancer, and it forms the connecting link between encephaloid and scirrhus.

The melanotic variety of medullary cancer, termed also melanosis or melanoid cancer, is exactly similar to it in appearance and structure, except that it is of a dark brown or deep black colour. This arises from the presence of an immense number of pigment granules which are either enclosed in the cells or free—the majority being free; some of the granules are of much greater dimensions than others.

This variety of medullary cancer is met with either intermingled with the white encephaloid tumour or alone, the latter being the most frequent.

The cystic variety of medullary cancer is characterized by the presence of an immense number of small cysts, so that the tumour appears in some instances to be almost entirely composed of them, the cancerous structure only filling up the interstices between them. These cysts contain a serous fluid.

The osteoid species of cancer generally, but not invariably, springs from a bone. The lower end of the femur is by far its most frequent seat. On section, it is seen to consist of two distinct structures—of a very dense and remarkably tough, fibrous tissue externally, and of an osseous portion which is closely connected both with the fibrous substance and with the subjacent bone, when the tumour springs from one. When examined microscopically the fibrous portion is found to consist of fibrous tissue, having cells exactly similar to those of scirrhus, embedded between its fibres; these cells vary very much in number and are more numerous the softer the tumour happens to be. They are also more numerous in the secondary growths than in the primary ones.

The bony portion of these growths has an irregular, knobbed surface; below this it is extremely hard and compact—very difficult to cut, but it may be readily rubbed to powder.

Microscopically it consists of true, but imperfectly formed, bone. Its structure is more perfect in primary growths than in secondary ones—more perfect in those that originate from a bone than in those that do not. This species is closely allied on the one hand to the fibrous species of cancer which is next to be described, and on the other hand to that variety of encephaloid containing an osseous basis.

Fibrous cancer. This remarkable species of cancer may be readily distinguished from all the other species by the fact that its structural characters are identical in every respect with those of the ordinary benign, fibrous tumours. It has an exactly similar appearance to them on the surface of a section, and when examined microscopically no cancer cells of any kind are to be discovered, nor any free cancer nuclei.

The colloid species of cancer almost always occurs in the first instance as an infiltrated growth. It increases very rapidly, and sometimes attains a very large size. On section, it is seen to consist chiefly of a viscid, clear, gummy substance like jelly; this appears to be embedded in loculi or cysts of various sizes and shapes, which are formed by a dense, white, fibrous material. This and the colloid matter occur in very variable proportions in different tumours, and even in different parts of the same tumour. The colloid matter varies very much in consistence, sometimes being almost fluid, and at others as firm as firm jelly. It does not appear to have any definite structure when examined microscopically, but it contains embedded in it nucleated cancer cells similar to those before described, but generally smaller and more imperfectly formed. It contains also other cells of large size, which need not be here described.

The stroma forming the walls of the cysts consists of remarkably fine fibres arranged in masses of curved bundles; the cysts so formed are not complete cavities, but communicate freely with each other.

This species of cancer is closely connected with the medullary cancers through the cystic variety of that species.

The epithelial species of cancer—or epithelioma as it is sometimes called—occurs almost invariably as an infiltrated growth, and nearly always in or beneath the skin or mucous membranes. Before ulceration has occurred in it, it never extends very much in depth, it has a tendency to extend rather in width and length.

In its typical form it is met with as a hard growth, raised a little above the level of the part from which it grows. Its surface is almost invariably rugose or warty, sensitive and very vascular, either moist or covered with a scab. When a section is made through it we find proceeding from the external surface, first the scab formed by the hardening of the discharge mixed with blood and epithelium scales, next, the enlarged papillæ closely packed together, and seated on a firmer layer of closer texture and greyish white colour, which gradually shades off into the healthy parts. When this substance is subjected to pressure we may squeeze from it an opaque, white, curdy substance, which is often very soft, and similar to that which may be expressed from the sebaceous follicles in cases of acne; it does not become uniformly diffused when mixed with water as the cancer juice does, but floats about in distinct particles. This is very characteristic of epithelial cancer. It is very variable in quantity in different specimens of the disease; sometimes it appears to be scattered through the firmer substance of the growth in the form of distinct deposits of greater or less size, and occasionally in very soft specimens it appears to form the whole of the morbid growth; its structure is exactly similar to that of the firmer portions of the disease.

When microscopically examined epithelial cancer is found to consist almost entirely of cells exactly similar to the cells of tesselated epithelium lining the lips and mouth; these cells are infiltrated into the tissues of the part affected, and are within the papillæ of the skin. In some few instances the cells approximate more closely to the columnar type.

Free nuclei are very frequently met with, especially in cases which have made very rapid

progress; these either exactly resemble the nuclei of the epithelium cells or they are larger, with more brilliant nucleoli, and are with difficulty to be distinguished from those before described as characteristic of scirrhus.

Some cells are also to be observed which are called brood cells, from the fact of their containing one or more cells in their interior.

Lastly we find what are termed capsules or epidermic globes. These are met with in no cancers except the epithelial. They are the most numerous in the yellow, cheesy matter which has been described. They are of very large size, being from $\frac{1}{100}$ to $\frac{1}{500}$ of an inch in diameter. They appear to be formed by the juxtaposition of many epithelial cells, so as to form laminæ, and which are rolled round so as to form the walls of a central cavity; in this central space we find a granular matter, cells and nuclei; the cells so included are not epithelial cells, but round or oval in shape, and very similar to scirrhus cancer cells in structure. The nuclei, whether free or enclosed within the cells, also resemble those of scirrhus.

The only variety of the epithelial species of cancer is the melanotic. This has exactly the same structure as that just described, but the epithelial cells contain dark brown or black pigment granules, giving the whole growth a similar appearance.

CHAPTER III.

SCIRRHUS GROWTHS.

IN the previous chapters I have described the physical and microscopical characters whereby scirrhus tumours may be distinguished from every other growth belonging to the group of malignant diseases.

I shall now proceed to describe, with as much detail as the importance of the subject demands, the symptoms, progress, diagnosis, and treatment of the chief scirrhus growths as they commonly fall under the notice of the surgeon, illustrating their description mainly by a reference to cases that have occurred under my own observation.

Although scirrhus cancer occurs in many textures and various organs, its relative frequency is so much greater in the breast and the rectum that its consideration in a surgical point of view is almost narrowed to its development in these situations. I shall commence with the study of its formation in the breast.

SCIRRHUS OF THE BREAST.

Scirrhus cancer occurs in the breast invariably as a primary disease. In its earliest stage of growth it appears as a distinct and very hard tumour, often moveable, free from pain, and in size not larger than a hazel nut. It is never inserted in the midst of the textures of the breast, nor is it ever invested by a capsule, but it is almost always present as an infiltration.

For a considerable period the tumour may escape detection; some accidental circumstance directing the patient's attention to a condition that had really existed long before.

It is generally situated either in the centre or at the edge of the mammary gland. At first it is somewhat rounded, it afterwards becomes irregular in shape, and as it merges into the general structures of the part, it is found occupying a considerable portion, and not unfrequently the whole of the breast.

As the tumour grows the adjacent tissues become affected; the skin becomes adherent, and after a time discoloured, and there is a gradual contraction and absorption of surrounding parts. In some instances this contraction takes place to such an extent as to leave no traces either of the tumour or of the mammary gland. This form of disease has been described by some authors under the name of atrophic scirrhus. It is well illustrated by the case of Mrs. E. B. and S. T., related in this chapter. As an early result of this indrawing tendency of scirrhus cancer the nipple is very frequently retracted.

Regarded in its first origin, scirrhus may be deemed a local malady. In this condition it may long remain, but it by no means follows that at any time in its history it really is so.

This point, as well as its occasional growth from a cicatrix, is exemplified in the case of

M. P., a married woman, *æt.* 45, of pale, anxious appearance, who was admitted under my care in the Hospital, November 6th, 1857, on account of a hard swelling near the right breast.

Twenty years ago she had a lacteal abscess of the right breast. This was opened with a lancet, and the wound healed. A year and a half since she first perceived a hard lump, about as large as a marble, situated immediately under the cicatrix of the abscess. As this did not give her any pain, she took no notice of it until about three months before coming to the Hospital. She then felt severe shooting pains extending towards the axilla, and through to the shoulder joint. She is not aware of any member of her family having suffered from any form of cancerous disease.

Actual condition.—The cicatrix alluded to is placed on the outer side of the right breast, just beneath the pectoral fold; its inner margin appears to be connected with the edge of the breast, but both breast and cicatrix are freely moveable on the parts beneath. The tumour occupies the situation of the cicatrix, having grown in its textures. It is of the size and shape of a filbert, and somewhat painful to the touch. The axillary glands are not enlarged.

November 18.—*Operation.*—By an elliptical incision I was enabled to include the whole of the cicatrix, as well as the tumour, and so clear them away entirely from the parts beneath. One or two small vessels required ligature; and in the evening, all bleeding having ceased, the edges of the wound were drawn together by sutures.

Examination of tumour.—On section, this presented the physical characters of scirrhus cancer.

The immediate result of the operation was severe constitutional disturbance, attended by sloughing in the wound and adjacent glandular enlargement. At the end of five weeks she left the Hospital; and at the end of six the wound had healed, and all hardness and glandular swelling had disappeared.

June 28th, 1859.—Mrs. P. showed me a small pea-like body, very hard, situated in the cellular membrane above the cicatrix; the skin covering it was attached to it, but without discoloration. Her general health was good, but her expression anxious, and complexion very pale. I advised her to leave it alone unless it grew.

October 16th, 1865.—Eight years after the removal of the tumour this patient is in good health. During the last few months a small sore has formed at the seat of the little, pea-like body. The ulcerated surface is now not larger than a fourpenny piece. There is, however, a good deal of hardness about it, and, with the cicatrix of the former operation, it has so far contracted the parts that the breast is drawn towards the axilla. The glands are not enlarged. She informs me that she has pain about twice a week; this is of an aching character, and appears to penetrate the chest.

In size, scirrhus tumours are not large. It is rare to see the largest as big as the two fists. Usually the diameter of them varies from about two to three inches.

Their formation and existence for many months, and sometimes for years, is unattended by pain; this was the case in sixteen instances out of forty-four observed by myself. It is otherwise at the close of the malady. When it does occur early it is generally of a lancinating or burning character. The patient's health, moreover, does not always suffer, and it is often hard to convince a woman in this stage of the disease, in apparently good health, that she really carries with her the seed of a mischief so fruitful of future suffering. In the last stages of the disease intercostal and spinal pains, as well as intense and deep-seated pains in the ribs and sternum, are present, and cause great suffering to the patient.

After a time the local cancer shows signs of becoming general. One of the very first of these is observed in the affection of the adjacent lymphatic glands. The axillary glands enlarge first, and they are followed by those placed beneath the lower pectoral, and by those situated above the clavicle. I have recorded the condition of the glands in fifty-three cases: in twenty of these there was no enlargement, in thirty the axillary glands were involved, the subpectoral in two, and the supra-clavicular in one. Very frequently the pressure exercised by these hardened and enlarged glands on the subclavicular and axillary veins causes œdema of the upper extremity. This takes place at periods varying from a few months to one, two, or even more years.

Accompanying the lymphatic enlargement there is a change in the general aspect. The expression becomes anxious, and there is a peculiar pallor and even yellowness of the complexion; in a word, the cachexia, indicative of constitutional taint, is established.

In regard to emaciation it may happen that it is entirely absent. Some patients retaining a remarkable plumpness and freedom from anxious expression almost to the last. When, however, cachexia sets in, wasting of the body almost constantly accompanies it.

The following case well illustrates the absence of wasting and pain.

Mrs. E. R. B., *æt.* 46, came under my notice in October, 1862.

At the age of twenty-eight, when confined of her first child, she suffered from milk abscess in the right breast. This gave way of itself, and she was not prevented from continuing her suckling. She never had any blow on or injury to the breast. About eighteen months since she noticed that the nipple of this breast was disappearing, and this circumstance was followed by a general hardness, increasing gradually, so as to involve the entire organ. After a time she became pregnant, and was delivered, about five months since, of a remarkably healthy child. Soon after her confinement the breast broke into a sore, and thenceforth it contracted in dimensions.

She tells me that she never had much pain, and that now she has no pain of any kind. She only feels intense weakness and debility. About two months since œdema of the arm commenced.

Actual condition.—External appearance that of a singularly comely, interesting woman. The right breast has entirely disappeared, its place being occupied by a deep cleft, situated beneath the pectoral muscle. There is no great sore at the bottom of this fissure, but only a few flattened granulations. There is œdema of the surface of the chest above the sore, about the shoulder, and down the arm. Numerous glands are enlarged in the axilla. The breathing is very difficult, and she rests in a chair, leaning towards the right side, never being able to lie down. There is no appearance of wasting whatever.

From the time when I saw her until her death, which took place November 5, 1862, she never left her chair by the fireside.

She never once complained of pain; indeed, until within a few days of her death she dwelt on the chances that an operation might yet give her of life. Gradually the breathing became more difficult. The nose as well as the lips became livid, and she sank more like one asphyxiated than as if worn down by an exhausting disease. There was no examination after death.

The general tendency of scirrhus tumours being to contract the part they invade, the very constant and early adhesion of the skin to the growth can be readily understood. Elastic expansion of the skin, so characteristic of the encephaloid formations in this gland, is impossible. It soon changes colour, assuming a violet hue; at last it gives way by a kind of erosion, and finally ulcerates.

Before this occurs the nipple is retracted. This arises, in these slow-growing tumours, from the never-ceasing contraction and absorption of parts inwards; and, especially, according to Lebert, from the rigidity and disappearance of the lactiferous ducts. In the quick-growing tumours this symptom is the exception, and arises from their being less hard, larger, and with the skin covering them more expanded. Taken by itself retraction of the nipple, as a diagnostic of scirrhus, is unimportant, as it may, and frequently does, arise from the most ordinary mammary inflammations; but, when regarded in connexion with the other symptoms I have described, it constitutes a most important circumstance in determining the exact nature of the disease.

The soft, rapidly-growing forms of scirrhus are termed acute; their history is exemplified by the following case:

Miss V., *æt.* 32, fresh-coloured, and very healthy-looking, was brought to me January 17, 1865, by Mr. Boswell, of Redditch, on account of a tumour in the left breast.

Ten months since a large sugar cone fell against her chest, and bruised the gland, so much so as to cause pain. She forgot this circumstance until four months since, when she detected a hard substance in the breast, and noticed that the nipple had disappeared. Up to this time there was no pain, but she had become thinner. Her maternal grandmother died of cancer of breast.

Actual condition.—Breast heavy, uniformly infiltrated by solid material; nipple retracted; and skin adherent, but uncoloured. One gland contiguous to the axillary edge of the mamma, hardened and enlarged.

January 26th.—I removed the breast, together with the gland, and carefully cleaned the fibres of the great pectoral muscle.

On section the breast presented the characters of acute scirrhus cancer.

This lady called on me in the first week of April, nine weeks after the operation. She had made a good recovery, the wound being sound; but the adjacent surfaces were discoloured, of a livid hue, and had a board-like hardness; the skin was for many inches around adherent, and there was an enlarged gland in the commencement of the axillary space.

The period at which ulceration takes place varies greatly in different cases. Most commonly it occurs between six months and two years, and sometimes it is prolonged far beyond this time. When it does take place it assumes two distinct forms—the superficial and the deep.

The superficial is a mere erosion, an irregular-shaped sore, on the surface of the breast, without raised edges.

The deep, as its name indicates, penetrates within, removing in its progress the mammary gland, muscles, or bones. The edges of this ulcer are raised, hardened, and infiltrated by cancerous matter, and present an irregular margin. The base or floor of it is of a greenish yellow colour; though, at times, in earlier stages, the entire sore may have the appearance of being occupied by healthy granulations.

The spread of this ulcer is subject to great variety. It may never reach more than the size of a crown piece, or, not unfrequently, it may extend to the axillary supra-clavicular, or even the scapular regions. Whilst the superficial ulcer discharges little, the deep pours forth an abundant matter, possessing a very peculiar and characteristic odour. Moreover, attacks of hæmorrhage frequently occur as the ulcerative process advances, but the loss of blood is seldom to a large amount.

This form of ulceration sometimes extends over a considerable period of years without making much progress, the patient dying from hæmorrhage or the affection of some internal organ rather than from the spread of the disease. This is well exemplified in the case which follows.

Mrs. A. B., *æt.* 50, a spare, dark-haired woman, came to the Hospital in July, 1858, on account of a tumour of right breast.

History.—Married at forty; she is the mother of one living child, and has had one miscarriage. She never menstruated until twenty, and then only scantily. Her family history is a good one. She never sustained a blow or injury on the part. Five years since she for the first time noticed the swelling.

Actual condition.—Right breast, nipple, and areola natural. Integuments puckered-in below nipple. Tumour hard, painful, situated in mammary gland below nipple. Skin covering it adherent, but unchanged otherwise. One or more hard glands along edge of pectoral. General health good.

Advised that she should leave the disease alone.

I did not see this patient again until June 1st, 1865, when she was sent to me by Mr. Bond, of Polesworth. She was wasted and looked ill. Until six months since she had remained in good health—able to go about and do work out of doors. The ulceration about the breast had been going on slowly for about seven years, sometimes giving rise to an aching, scratching pain—very often she was entirely free. A week since the right arm began to swell; and some days before this she had cough.

At this period the actual condition of the part is that of a large, open, scirrhus ulcer; it occupies the position of the right breast below the fold of the pectoral muscle. There are no enlarged glands; but the induration and contraction of the surrounding textures extends to the axilla. Her breathing is quick, and she is very feeble; and from these symptoms I anticipate a speedy close to the career of twelve years that the disease has run in her case.

Finally, death appears to take place from a gradual decline of the vital powers; but it is immediately due, in many instances, to the effects of the secondary deposits, which invariably consist of encephaloid cancer, in the pleura, lungs, or other organs.

I have recorded the ages at which this disease first appeared in seventy cases: one was twenty-seven; twenty-two were between thirty and forty; twenty-one between forty and fifty; nineteen between fifty and sixty; and seven between sixty and seventy.

I have had the opportunity of observing the occurrence of scirrhus cancer of both breasts in two cases, each of which I relate at length. In the case of E. B. there appears to have been an interval of four, and in that of S. T. an interval of nearly three, years between the first appearance of the disease in each breast.

Mrs. E. B., *æt.* 63, a remarkably plump, healthy-looking woman, was sent to me by Mr. Wilkinson, surgeon, of Steelhouse Lane, February 24th, 1860, on account of a swelling in left breast.

History.—A few months previously she noticed a small, hard lump in the left breast, nearly on a line with the nipple. It was painful, and was situated near the seat of a gathering which had occurred

some twenty-five years ago. She is the mother of five children. There is no history of cancer in her family.

Actual condition.—A full and well-shaped breast. On the outer side of the nipple there is a tumour nearly as large as a small orange. It is firmly connected with the mammary gland, and the integument covering it is closely adherent to its substance. In other respects this latter is unchanged. It is externally hard and painful to the touch, and beneath the pectoral muscle two or three glands are felt enlarged and indurated. Her general health is excellent, and she has not in any way suffered from the presence of the growth.

Having regard to her age, to the entire absence of change in her health, and the little inconvenience the tumour appeared to give, I recommended her not to interfere with the breast in any way, but to avoid pressure on the part and to keep the arm quiet, and take liquor potassæ arsenitis.

I did not see this patient again until nearly four years had passed. At the beginning of 1864 she requested me to visit her. The left breast had diminished in size considerably since the tumour had broken, which occurred about two years since. The ulcerated surface presented the ordinary appearance of scirrhus cancer. She is thinner, but not much so, and there are no evidences of severe constitutional disturbance. Very recently she has noticed two hard tumours in the right breast on a level with the nipple, firmly attached to the mammary gland situated on its inner side, and already adherent to the skin. These give rise to lancinating pains, more or less, day and night, and she says that they present all the features that belonged to the growth in the other breast at the same period of development. I again recommended the continued use of the arsenical solution: otherwise in no way to interfere.

February 16th, 1865. An attack of violent hæmorrhage occurring I saw her again with Mr. Wilkinson. The loss of blood had blanched her, but in other respects she was unchanged. The left breast had become flattened—indeed, had disappeared—save by its situation being marked by a board-like hardness, and a wrinkled, cicatricial surface. The right breast presents a large, elevated, protruding nodule at the seat of the two tumours, and below it a deep ulcer, both intensely hard and discharging blood and matter.

The glands that five years ago were perceived in left axilla are now gone, and none are to be found enlarged in the right. The hæmorrhage was restrained by pressure, and after a few days she rallied from the loss of blood. Soon after sloughing took place very rapidly, and after its cessation the same process of contraction and cicatrization became established as was observed in the left breast.

March 27th. Her health had much improved. The protruding growths were entirely gone and the breast almost flattened. No hæmorrhage had occurred since the attack recorded. Exhaustion gradually set in, and she died on the 22nd of July, 1865.

S. T., *æt.* 43, married, a delicate-looking woman, with dark brown hair, came to me at the Hospital, on account of a tumour in the left breast, in January, 1862.

About two years since she first noticed a small painful swelling in the substance of the left breast, produced, as she thought, by the pressure of the steel in her stays. From the commencement she had acute lancinating pain, which occasionally extended down the arm. She states that there is no history of cancer in her family, but that her father, now sixty-seven years of age, had recently had a considerable tumour removed from the upper part of his back, which had formed at the seat of a congenital mole.

Actual condition.—The breast is charged with an uniform hard tumour, it is already contracted in size, and immoveable on the pectoral muscle beneath. The nipple is retracted. There are no glands enlarged in the axilla, but there is a ridge of thickened texture extending from the breast to that space. The left breast is small, but unchanged. The patient describes her pain as intensely acute, and scarcely without intermission.

There being no operative interference to be thought of, I placed her for months together on small doses of the solution of liquor potassæ arsenitis, with marked improvement to her general health.

May 11th, 1863.—I again carefully examined Mrs. T., not having seen her for many months. She informs me that about nine months since she observed hardness in the right breast, commencing about the nipple, which gradually disappeared; at the same time the gland appeared to get smaller, and pain, which she describes as of a drawing character, became very constantly present. Her condition at this time was marked by wasting. In the right axilla one or two distinct, indurated glands could be felt, but these seemed fast merging into a line of induration extending from the breast along the side of the chest. The left breast is entirely gone, a densely-contracted, indurated surface being alone left.

I saw this patient a few weeks before her death. The disease progressed in the manner above described. Both breasts disappeared, an indurated surface marking their former position, whilst board-like hardness extended on either side to the axillæ and downwards, over the upper two-thirds of the abdominal wall.

She died, worn out, October 31st, 1864. There was no *post mortem* examination.

Scirrhus is very rarely associated with any other form of cancer in the breast, but the following case affords a well-marked instance of the co-existence of scirrhus and encephaloid.

A. S., *æt.* 36, a married woman, of most anxious appearance, was sent to me by Dr. Jordan, of Edgbaston, and admitted under my care in the Hospital, December 22, 1858, on account of disease in the left breast.

In August, 1856, one month after her confinement, she suffered from milk abscess. This left a hard-

ness in the breast, above the nipple. In December, 1857, three months after the birth of a second child, and whilst suckling, the hardness referred to grew into a tumour.

Three months ago, when Dr. JORDAN examined the breast, he found a small hard, painful tumour, deeply seated, of the size of a walnut, placed above the line of the nipple. There was also what appeared to be an enlarged gland under the pectoral muscle. He judged it to be scirrhus, and in this view sent the patient to me then, but I did not see her. Subsequently, fluctuation appearing to be present, an opening was made and a glairy fluid like that contained in a cyst was let out. The family history is, that on father's side the grandmother died of cancer of the breast, but not at an early age. Her father died at eighty, and her mother at sixty-four, of diseased heart.

Actual condition.—The breast is very large, very hard, and gives no trace of natural structure, with the exception of the nipple and the integuments below, which are entirely unchanged. Above the nipple the disease has burst outwardly, and has pushed forward a fungous-looking growth. From this the size of the breast diminishes and contracts, as by its base it rests on the chest in the character of a hard scirrhus tumour.

Beneath the pectoral muscle is a tumour of the size of a goose egg, but the axillary glands are not affected.

December 25, Christmas Day. At the special desire of the patient I removed the breast. There was a good deal of bleeding. After the removal of the organ I passed my finger underneath the pectoral, and with my finger nail ruptured the capsule of the tumour there. By this means I easily turned it out.

Examination of tumour.—The lower part presented the well-marked characters of scirrhus cancer, whilst the upper, terminating in the fungous protrusion, was of the encephaloid variety. The secondary tumour also was markedly encephaloid.

After the operation she improved in health. The wound healed, and she was discharged three weeks after her admission.

This patient died as nearly as possible in twelve months after the removal of the breast. There was no examination after death.

The male breast is occasionally, though by no means frequently, attacked by scirrhus cancer. I have myself seen four cases, three of which I shall relate.

The disease originates in the rudimentary mammary gland, or in the nipple, or in the parts closely adjacent to it. In its origin, in its mode of growth, and in its tendency to a fatal termination, it runs a course identical with that of the same disease in the female, but, perhaps, generally it occurs at a more advanced period of life; thus, of the cases I have alluded to, the youngest was forty-four, the remainder being all of them nearly sixty; but in every other respect it will be found to pursue a similar course.

D. G., *æt.* 59, a strongly-built man with sandy hair, was sent to me by Mr. J. H. HOUGHTON, surgeon, of Dudley, December 29th, 1862, on account of a disease in his right breast.

Four years since he for the first time noticed a lump of the size of a pea, near the right nipple. It was not attached to the skin, and there was no pain in it. This gradually increased in size, and about two years ago there came some small lumps in his armpit. There was still no pain. The swellings in the breast and in the armpit went on increasing until about nine weeks ago, when they gave way on their surfaces and became open sores. At this time the tumours in the axilla, which were closely joined to each other, and which formed a sore a little before their earlier neighbours in the breast, were about as large as a good-sized walnut, whilst those in the breast were rather larger. About a week before the tumours broke he suffered some pain about them, but attributed it to rheumatism. Soon after this his arm began to swell on the affected side, and though he felt fairly well in himself, he noticed that he became gradually thinner. There is no family history of cancer.

Actual condition.—Around the position of the right nipple—for all trace of the nipple is gone—is a mass of indurated structure, two inches in diameter, not very prominent, with the skin adherent around, and drawn into folds. In the centre of this is an irregular sore, with raised everted edges, and with granulations of an ashy-grey colour. In the axilla there is a mass of enlarged and hardened glands, with an indolent ulcer on the surface of the projection. The skin around is puckered and drawn in towards the edge of this ulcer. The right arm is considerably swollen. He has no marks and no other swellings about his body. He has now a good deal of pain, more especially at night, which he describes as being of a shooting character, passing from the breast up into the axilla, and down the arm.

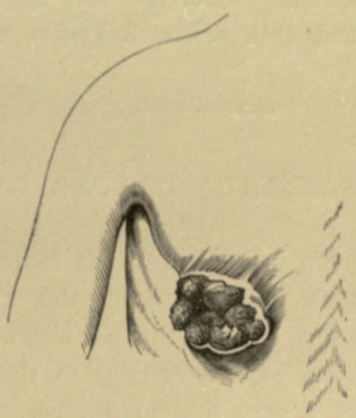
As there was no surgical treatment likely to benefit his condition he left the Hospital, early in January, 1863, and died in the month of September, in the same year. Ulceration extended through the axilla and down the arm, the latter being greatly swollen before his death.

R. B., a sweep, *æt.* 44, a small-made, spare, and somewhat anxious-looking man, was sent to me by Mr. OAKES, October 20th, 1860, on account of an ulceration in the right breast.

Six or seven years since, whilst pursuing his business, he thought he injured his breast by over-exertion. Soon after this he noticed a small lump situated on one side, and a little above the nipple. It was free from pain. It increased slowly, and in the course of four or five years attained the size of a chestnut. Two years since the skin gave way, and a sore formed. The pain was not severe before

the tumour ulcerated, but there was some increase in it afterwards, and he noticed the axillary glands became enlarged. He never had a blow on the part.

Actual condition.—The situation of the right nipple is ulcerated, and occupied by eight flattened tubercles, which are well represented in the subjoined woodcut, they are but slightly raised above the surface of the mammary gland, which is distinct, enlarged, and of scirrhus hardness.



The granulating surface discharges a thin, fœtid pus, and slightly extends its area from week to week. Under the edge of the pectoral and in the axilla are several indurated glands. The skin is generally dusky and harsh, but without any cutaneous moles, nor are there other swellings of any kind about him.

He has cough, and has grown thin of late. A week since spat blood for the first time. His father was in the army, and died of consumption between thirty and forty; there is no history traceable of tendency to "soot cancer" in his family, as he is the only one, to his knowledge, that has pursued his particular employment. For himself, he states that he never had anything the matter with his scrotum, though he had been in the soot from his earliest days.

I saw this patient a few months after his first visit to me. He had become much thinner, and his cough had increased. The right lung was apparently occupied by a solid mass of disease.

He died April 12th, 1861. There was no dissection.

The late Mr. Garrard, of Atherstone, brought to me Mr. T. P., a strong, stout-looking man, of florid complexion, *æt.* 59, by occupation a farmer and butcher, on account of a suspicious enlargement of the left breast, March 12th, 1863.

A few months previously he happened to find one night that the left breast was enlarged. He knew of no injury having been received. His family history was good. He consulted his surgeon, and soon after saw Dr. Heslop with him, who thought that the enlargement of the breast at first subsided under constitutional treatment and the local application of iodine; subsequently, however, being doubtful on the subject, he advised him to come to me.

Actual condition.—The left breast is indurated, the skin covering it is adherent, the nipple retracted. It measures an inch and a half in widest diameter, and is very nearly spherical in shape. The accurately defined tumour can be readily taken up from the parts beneath. It is uniformly very hard. The axillary glands were not enlarged. There was no pain.

I advised the patient to have the tumour removed; but, as he did not suffer inconvenience or pain, he was loth to believe in the necessity of this measure, and passing soon into the hands of a practitioner who assured him he had not cancer, and that there was no need for the knife, I, for the time, lost sight of him.

Little more than three months sufficed for this tumour to break, and when I next heard regarding him the state of the part was such as to forbid any prospect of benefit by excision.

July 20th, 1864. I had an opportunity of seeing Mr. P. A large excavating, winding ulcer, as large as the open hand, occupied the situation of the left breast. There were one or two axillary glands enlarged, especially beneath the pectoral muscle. The ulcer shortly extended, deepening in centre and extending at its circumference—in places sloughy, but showing healthy granulations; the margin disappearing in scirrhus-like hardness of the adjacent structures. Though he suffered a good deal of pain at times, the disease had made but few ravages in his appearance, and it was evidently, even now, mainly a local disease. Mr. Mousley writes: "T. P. died on the 31st December, 1864, after an attack of bronchitis; the ulceration was smaller than when you saw him."

Of the causes of scirrhus cancer of the breast, very little is known with certainty. Of forty-eight cases in which I have investigated the early history, six were referable to the effects of external violence. Eight were believed to have originated in consequence of breast abscesses, whilst in thirty-four the disease had appeared without any known cause.

The hereditary transmission of scirrhus cancer of the breast from family to family, and

especially in the female line, is a circumstance in the history of the disease that has taken strong hold on general as well as on professional belief. I find, however, that in seventy cases the previous existence of cancer in the family was unknown in twenty-two. Of the remaining forty-eight there were but six cases in which any hereditary influence could be traced.

It appears to occur more frequently amongst the married than the single; for out of fifty cases in which I have investigated this point, forty-five were married women and only five single.

TREATMENT OF SCIRRHUS CANCER OF THE BREAST.

No absolute rule can be laid down in regard to the removal of the disease by an operation.

The instances, however, in which extirpation by the knife will be deemed advisable can never be very numerous; for whoever has had an opportunity of watching many cases of scirrhus of the breast can scarcely fail to arrive at the conclusion that the proceeding has hitherto contributed to the duration of life in only a very limited degree.

Whenever the first appearance of the disease is attended by continued pain, by wasting, and by rapid growth, the entire breast affected should be removed without delay. Nor should advanced age, when other circumstances are favourable, be a hindrance to the performance of the operation. The patient's age happening to fall between thirty and forty or between forty and fifty, will afford a far stronger reason to induce the surgeon to urge consent than if it fall between fifty and sixty or between sixty and seventy.

The operation is very seldom fatal to life. Thus, of thirty patients who have submitted to it, under my own notice, three only died in consequence of its immediate effects. One ended fatally in seven days, and one died in three weeks of inflammation of the pleura, and one at the end of six weeks of exhaustion.

Nor should the limited implication of the adjacent absorbent glands be deemed an insurmountable barrier to the use of the knife, provided that they are capable of complete removal.

The same observation extends with equal force to the existence of ulceration.

On the other hand, when the scirrhus tumour is without pain, and of slow growth, producing no ill effects on the general health, and especially if it occurs after fifty years of age, the operation should not be recommended.

Further, if the ulceration is extensive, or if the pectoral muscle is involved, the disease should certainly not be interfered with.

Extirpation of the breast may be conveniently accomplished in the following manner:— The patient should be laid in the recumbent position, with the arm of the affected side raised towards the head. An incision commencing towards the sternum, beyond the limits of the gland and terminating towards the axilla, should include the nipple and adherent integuments in the shape of an ellipse. The breast being then firmly lifted by the fingers from its position over the pectoral muscle, the fibres of this are to be carefully cleaned by a few rapid strokes of the scalpel, and the diseased mass removed with as much of the surrounding healthy tissues as may be compatible with a speedy union of the parts.

If any enlarged glands require attention an incision should be made over them, dividing their cellular capsule, so as to enable them to be enucleated by the finger.

A few hours afterwards, all bleeding having ceased, the edges of the wound should be brought together as accurately as possible, so as to promote union wherever practicable by the first intention.

In those cases in which it is considered unadvisable to operate, the chances of external bruising and friction should be carefully avoided; with this view the breast should be well covered

by cotton wool, all pressure from the stay bones should be taken away, and the arm of the affected side should be constantly carried in a sling.

The diet should be generous, consisting of fresh meat, milk, and eggs daily, with a suitable allowance of wine or malt liquors.

Frequent examinations of the tumour should be forbidden, and anything tending to harass or excite the mind should be avoided.

Those remedies which improve the appetite and the general health may be exhibited with benefit from time to time, the practitioner being simply guided in their administration by general principles and the special circumstances of the case. For my own part I have for many years given the solution of the arsenite of potash, and have found that its prolonged exhibition has been attended by a marked improvement in the health, and by a tardy progress of the disease. I have continued its administration for several years in some cases, and have never found, when carefully watched, that any ill effects have been traceable to its use. It should be taken after meals, and the dose, if it be long continued, should rarely exceed four drops in some cinnamon water.

In the earlier ulcerative stage care should be taken to keep the wound as clean as possible. If there be little pain, water dressing, or lint dipped in olive oil, and an occasional poultice, will suffice for this purpose. When the ulceration extends, and the cancerous odour is present, the wound should be washed at least every six or eight hours with a lotion containing either a solution of chlorinated soda or of the permanganate of potash.

In the later stages the occurrence of hæmorrhage must be carefully guarded against. It will then be well to avoid all relaxing dressings, and especially poultices. The wound should be padded, and the chest encircled by a bandage.

When hæmorrhage is present the ulcerated spot or granulation should be carefully exposed, and iced dressings and pressure applied to it. In case these fail the actual cautery should be used without hesitation.

To mitigate the night pains opiates may be freely given and benefit will very frequently be derived from their combination, and especially from that of opium and conium, whilst large doses of quinine will do more than anything else to relieve the periodic attacks of suffering which are present in the latest stages.

CHAPTER IV.

SCIRRHUS OF THE RECTUM.

THE symptoms of cancer of the rectum, as first observed by the surgeon, vary considerably according to the stage to which the disease has advanced when it first falls under his notice.

As their appreciation is of the first importance in reference both to their diagnosis and treatment, I will divide their consideration into three stages.

In the first stage, in the midst of health, the patient, almost suddenly, becomes sensible of a change from the usual comfort in defæcation. The bowels become irregular, sometimes relaxed, but, generally, more constipated than natural.

In some cases there is pain in the bowels; in others none. Very often there is some mucous discharge accompanying the motions; whilst in other instances these may be observed to be streaked with blood. Tenesmus is not unfrequently present.

The general symptoms are those of dyspepsia, nausea, loss of appetite, and an uncomfortableness after taking food.

If the rectum be examined by the finger it will in all probability be found to be narrowed and more or less hardened. This condition generally commences about an inch and a half above the anus, but it is sometimes very much higher than this, as in the case of C. P., related below.

In the second stage the obstructive symptoms are more decided. Pain is frequently present, and especially during defæcation. Muco-purulent or sanguineous discharges are generally noticed, and the stools have in some cases a flattened or ribbon-like appearance. There is often, moreover, considerable spasm about the anus.

The health suffers in a marked manner. The aspect of vigour changes for one of debility, whilst the complexion assumes an earthen or leaden cast.

A digital examination at this period may disclose the evidences of the cancer in the shape of hard nodules, disposed beneath the mucous tissue. These intruding masses sometimes retain their character of distinct knobs or tumours for a considerable period, affecting the calibre of the gut by growing inwards, and when they are so disposed as to encroach within, from the anterior and posterior, or from the opposite lateral surfaces, at the same time, they produce the flattened stools above referred to.

The walls of the intestine adjacent to the stricture will be found materially thickened and partaking more or less completely of the character of an infiltration.

If ulceration has taken place the finger will be smeared with blood, and the extent of the destruction of the mucous lining will be easily ascertained, as it is usually well defined by the hardened ridges marking its separation from the healthy parts.

Above this now material constriction the gut will be found dilated, whilst below it is diminished. The increase above is, doubtless, owing to the distention occasioned by accumulated fæces.

Not unfrequently the scirrhus in the rectum is complicated by fistula; and I have myself seen more than one case where the fistula was treated by the ordinary means without its origin in cancer having been suspected.

As it appears to me, fistula in these cases may originate in either of two ways.

In the one, a small deposit of cancerous matter softens above the upper limit of the disease, leading to the escape of the fæces into the opening, and in the end giving rise to an abscess. Or, in the other, irritation is propagated from the cancerous material to the cellular tissue in the ischio-rectal fossa, causing the formation of abscess, which may discharge itself either into the intestine, or externally, or in both ways; in either case the abscesses ordinarily terminate in the establishment of fistulæ.

That the mere distention of the walls of the bowels above the stricture by the accumulated fæces should induce perforation, and so establish that sequence of complications ending in fistula, appears to me improbable, and for the following reasons: First, the well-known fact that the contents of the intestines above obstructed portions are constantly fluid; and, second, the extreme infrequency with which even large masses of hardened fæces, retained for many weeks, have induced by their pressure any ulceration of the intestinal wall.

Finally, the urinary organs may be affected, retention being induced either by the occurrence of spasmodic stricture, or from actual pressure on the urethra itself by the extension of the disease. The formation of abscess and fistula, as well as the interference of the disease with the urinary organs, is well illustrated by the two following cases.

T. H., *æt.* 28, a labourer, of worn appearance, came under my notice in the Hospital, in September 1865. He states that he was perfectly healthy until twelve months ago, when he noticed a slight pain and uneasiness in defæcation, accompanied by the occasional discharge of blood in considerable quantities. These symptoms increased, and the discharges became purulent, fœtid, and constant. He suffered frequently from constipation for eight or ten days, attended with diarrhœa. His general health also had been rapidly failing. For five weeks before admission he suffered from intolerable pain in the perinæum, which he said had been somewhat relieved by the discharge of a large quantity of pus on the morning of his admission.

Present appearance.—Advanced cachexia manifest. There is fulness on the left side of the perinæum, with a small opening discharging pus midway between the anus and tuber ischii. On examination with the finger an irregular, softened mass is felt encircling the gut just within the anus, and at one point, towards the right side, a marked, fungous-like protrusion is distinguished, bulging inwards. All the parts are immoveable. The result of the examination was a copious hæmorrhage and very fœtid discharge. The glands in the groin are not enlarged. The urine is bloody, and is passed with pain. No family history of malignant disease.

The symptoms of exhaustion were unchecked by nourishment and stimulants. The urine was always more or less bloody. He became delirious, and sank from exhaustion October 17th.

Dissection twenty-four hours after death.

The lower four inches of the rectum were the seat of a soft, fungous, nodulated growth, ulcerated at several parts, and terminated below abruptly by a circular constriction just within the sphincter of the anus. The coats were so thickened by the deposits as to measure nearly an inch in thickness. Throughout the greater part all the coats seemed equally involved, but at several parts the disease had only occupied the submucous tissue, leaving the muscous and muscular coats comparatively free. On opening the bladder its cavity was observed to be reduced in extent, its rugæ elevated and vascular, and covered with phosphatic accretions; otherwise it was unaffected.

There was no adhesion to or affection of any of the pelvic bones. No glands were found to be affected.

Communicating with the fistulous opening on the left side was an abscess in the ischio-rectal fossa, closely approximated to the side of the rectum.

The remaining organs of the body were healthy. Microscopically, large poly-nucleated cells of various shapes and sizes were observed, with an abundant quantity of granular matter.

Mr. G. H., *æt.* 61, a florid, country-looking man, was sent to me May 7th, 1863, by Mr. G. Mousley, of Atherstone.

Five years since he commenced passing fluid stools, accompanied by frequent ineffectual desire at defæcation.

Two years and a half subsequently a fistulous opening formed outside the sphincter, which was divided, the gut being then found to be narrowed an inch and a half above the anus.

The division of the fistula did not seem to relieve the symptoms, and gradually he lost the power to control his motions.

Bougies were now passed with some relief, and he continued the practice of using them each night with more or less regularity up to the present time. Since their use the passage has been satisfactory, but the power over the sphincter has not improved. He has lost flesh during the last three days.

There is no history of cancer in his family, and he himself has always been completely healthy, pursuing a farming life.

Actual condition.—The finger detects extensive scirrhus ulceration of the lining membrane of the gut about an inch within the anus. The tube of the intestine is fairly open.

I advised the use of bougie every second night as gently as possible, and in all other respects to rest content with improving the general health.

After I saw Mr. H., gradual irritation of the neck of the bladder came on, accompanied by frequent desire to pass water, there being at the same time no relief to the progress of the disease in the rectum, though the escape of its contents was never completely arrested, owing to the continued use of bougies. He died October 29th, 1863.

The decline of health in this stage of the disease is often very gradual, and may be extended over many years. Accident, however, in the progress of the disease, more frequently determines the duration of life than the existence of the cancer itself; thus the direction of the surrounding adhesions may lead to perforation of the peritoneum, to penetration of the bladder or colon, or the tendency may be to occlude the tube of the rectum. On the other hand, the disease may extend but little to surrounding parts, and may interfere so moderately with the offices of the intestines as to place their persistence, within certain limits, in the hands of the surgeon, death ensuing in such instances rather from gradual exhaustion than from the presence of cancerous deposits in other parts of the body.

The third and last stage of the disease is marked by the more or less complete occlusion of the bowels. This arises in part from the continued contraction of the diseased portion of the intestinal walls, and in part from the in-growing of the protuberant cancerous nodules. The symptoms are now usually similar to those resulting from occlusion of the intestines produced by other causes, and are not in any way modified by the pathological nature of the obstruction itself. The bowels become rapidly distended, and are very tender when touched; vomiting occurs and soon becomes constant, until at length neither food nor medicine can be retained on the stomach; the pulse increases in frequency; the patient presents a most anxious and distressed appearance and becomes rapidly weaker and weaker, until at length death takes place either from exhaustion or from the supervention of some acute inflammation, which is not unfrequently determined by rupture of the bowel and discharge of its contents into the peritoneal cavity.

Diagnosis.—As far as my own experience extends, cancer of the rectum can only be confounded with one disease, and this only in its early stages. I refer to annular stricture of the rectum; and as this is by no means an uncommon disease, I shall carefully specify the points of difference between them. In annular stricture there is little or no pain in the bowels, whilst in cancer of the rectum there is usually not only some local pain at the seat of the disease, but diffused aching pains over the bowels. 2. The muco-purulent or muco-sanguineous discharge from the bowels occurs earlier, and is more abundant in cancer than in simple stricture. 3. On examining by the finger, the surface of the annular stricture will be found to be smooth in comparison with that of the cancerous disease, which is rough, irregular, and frequently studded with numerous prominent masses projecting into the intestines. 4. In annular stricture the bowel is never adherent to the surrounding structures, whilst the reverse of this is very frequently the case in the malignant disease. 5. The microscopical examination of the discharge will sometimes set the question as to the nature of the stricture at rest, even in very doubtful cases. In the discharge from annular stricture we may meet with pus, mucus, or blood globules, and scales of epithelium, whilst in that from cancerous disease we may meet with all these, and with the

so-called nucleated cancer cells in addition. 6. The presence of any cancerous growth in any other part of the body is very strong evidence that the disease in the rectum is of the same nature. Lastly. The constitutional symptoms in cases of simple stricture are neither very marked nor very urgent, and bear no proportion to the extent of the local disease, as ascertained by digital examination. It is not so, however, in malignant stricture. Here we find that the constitutional symptoms are comparatively early in their development and more decisive in their nature, and they bear a more distinct relation as to their intensity to the extent of the local disease.

As to the local causes determining this disease little or nothing can be said with certainty; but I am convinced that it not unfrequently originates in simple annular stricture of the rectum, as in the following case.

> E. P., *æt.* 47, a spare, delicate-looking woman, was admitted under my care, in the Hospital, in the early part of the year 1860, on account of inability to relieve the bowels.
>
> She tells me that she has suffered from constipation for the last five years, never passing a motion except by the assistance of medicine; in other respects her health has been good.
>
> On examining the rectum digitally I discovered an annular stricture, contracting the tube of the gut, and admitting the tip only of the little finger. Its free edge was thin, and gave the sensation of a firm, fibrous material. There did not seem any hardness about the attached portion. It was situated about an inch and a half from the anus.
>
> I divided the stricture by a probe-pointed bistoury at both its anterior and posterior edge.
>
> On the second day after this a suitable-sized elastic bougie was passed, and its introduction regularly repeated during a six weeks stay in the Hospital. At the end of this time defæcation had become far more regular, and the constipation altogether relieved by the use of small doses of the milk of sulphur with cream of tartar. She was recommended to persevere in the occasional use of the bougie.
>
> I did not see this patient again until the 7th of April, 1865. I then visited her with her surgeon, Mr. Bassett. Her husband informed me that the action of her bowels remained better for many months after leaving the Hospital, but that she discontinued the bougie. About a year since the motions became liquid and frequent, and she began to emaciate. For some months past she has had sickness, and at this time labours under all the symptoms of chronic peritonitis.
>
> On examining rectum a scirrhus cancer, in an advanced stage of ulceration, was detected.
>
> She died the following day.

Treatment.—But little is required in the way of treatment during the first stage of this disease. The diet should be carefully regulated, both as to quantity and kind, so as to avoid, if possible, any disturbance of the stomach and bowels. Tea and coffee should be prohibited, and milk given in their stead. Stimulants are very seldom required; if they should be needed, sherry wine is, probably, the best that can be taken. If constipation should occur, an attempt should be made to obviate it by some suitable change in the food of the patient rather than by the administration of medicines; but if this cannot be accomplished, then the mildest laxatives should be prescribed. I am decidedly averse to the use of enemata in this disease, and I should only sanction their employment in special cases. All local interference in this stage is worse than useless.

In the treatment of the second stage of the disease even more care will be necessary in regard to diet than in the first. Milk in abundance should be taken, together with fresh meats and eggs. If the patient can take any oleaginous matters, such as olive, cod-liver, or almond oils, as part of the daily dietary, this will greatly add to the comfort of defæcation, whilst farinaceous and other vegetable materials should be limited in amount.

At this period in the treatment of scirrhus of the rectum the local symptoms will most probably urgently demand the interference of the surgeon, in consequence of the tendency which the disease then exhibits to narrow or even to close altogether the tube of the gut.

The means of treatment at the command of the surgeon are mainly three:

First, the use of caustic applications; secondly, the complete excision of the part of the bowel implicated; and thirdly, the continued use of dilating bougies.

I have seen caustics of various kinds made use of in scirrhus of the rectum, but never with any material or permanent benefit; on the contrary, the stretching of the parts necessary to

their due application, as well as the severe pain resulting from them, always seemed to me to be more calculated to aggravate than to retard the progress of the disease.

The complete extirpation of the diseased parts—supposing them to be within the reach of the finger—can scarcely be deemed a proceeding which the surgeon can recommend. Even supposing that the cancer could be completely removed, the vicinity of the peritoneum must not be forgotten, nor the very probable advent of phlebitis.

Much relief may be obtained in this stage of the disease by the regular use of bougies passed through the narrowed part of the gut. They should be introduced into the bowel with the utmost gentleness, so as, bit by bit, to overcome the obstacle to defæcation.

These instruments may be made of similar materials to the ordinary elastic rectum bougies, and should vary in size from the thickness of a No. 8 catheter to that of the index finger.

Previously to the introduction of any bougie the width of the strictured canal should be carefully estimated, so that the dilation may be effected most gradually and gently, and the use of too large an instrument avoided.

It should be passed every second day, as a rule, immediately preceding the customary time of defæcation; and it will be found greatly to add to the comfort of the patient if the bowels can be induced to act only at this interval of time.

Before passing the bougie some fresh lard should be smeared over its surface; and having once fairly carried it beyond the obstruction, it should then be at once withdrawn.

When the dimensions of the gut have been fairly restored the use of the bougie may safely be left to the patient, but it must not be abandoned for one moment in any hope that the escape of the fæces established by its means will persist for a week without its aid.

As long as the calibre of the gut can be maintained in this way the use of enemata is not indicated. It will be better to run no additional risk of irritating the scirrhus surface when the bougie is acting well. I, therefore, recommend very gentle laxatives in order to supplement its action; and none act better than the confection of senna or the combination of the milk of sulphur and cream of tartar; or, where it can be tolerated by the stomach, the systematic use of small doses of castor oil will answer the same purpose.

When the time comes in the course of this disease that the contraction of the bowel will no longer permit the escape of fæces, then the only mode of relief left for the patient is by opening the colon and establishing an artificial anus.

As this proceeding can exercise but little salutary action on the cancer itself, and is merely a means of prolonging life, surgeons will always hesitate to urge its adoption, in the certain knowledge of this fact, and, perhaps, even still more in the recognition of the many miseries that attend on its most successful accomplishment.

On the other hand, my own observation and experience on the subject, derived from the actual watching of at least a dozen cases, leads me to the conclusion that there are instances in which the surgeon is most justly called on to acquiesce in the wishes of a patient, and even to recommend an operation of which, whatever else may be said against it, it cannot be said that it is in itself dangerous to life.

I cannot consider colotomy justifiable when the patient's vital powers are giving way from the effects of the obstruction. If it is performed at all it ought to be practised at the very commencement, not at the end of the third stage.

The obvious advantages of this view are manifest in the better prospect there would exist of prolonging life. Moreover, I conceive that the satisfactory escape of the fæces through the artificial anus would, in many instances, afford the surgeon opportunities in which attempts, not otherwise practicable, might fairly be made to restore the passage through the diseased bowel, in the same way that surgery proceeds to restore the channel of the urethra aided by the temporary outlet of a punctured bladder.

The conclusion, then, at which I arrive is, that if in any given case which early exhibits features of obstruction, and in which the urgent symptoms are attributable to this cause rather than to the constitutional effects of the progress of the cancer itself, the operation for artificial anus is carried out, the prospects are such that its propriety may be established; whereas, if continued only to be thought of in the last stage, when days and not months of dearly-bought life are the return, it will have to be abandoned altogether.

The descending colon, where it is uncovered by peritoneum, may be opened in the following manner, as originally suggested and practised by Amussat in 1839. The patient being laid on the face and belly at full length on a suitable table, the arms and chest being disposed so as not to interfere with the respiration, the bowels should be moderately supported by a broad, soft pillow, and the exact position of the colon ascertained by its anatomical relations, by percussion, and, possibly, by distention. A transverse incision through the skin and subcutaneous tissue is now to be made, from three to four inches in length, commencing at about two inches from the spine, and being distant one inch and a half above the crest of the ilium. At the posterior part of this wound the latissimus dorsi and quadratus lumborum muscles will be encountered and divided, and then the deeper layer of the abdominal wall, consisting of the internal oblique, the transversalis, and aponeurosis, having been carefully cut across the fat and cellular tissue immediately over, the colon will be brought into view. Having gradually removed this with the finger and handle of the scalpel the position and character of the part can be made out. The surgeon having satisfied himself by a thorough and patient examination that the greenish-looking intestine which projects into the wound is in reality the colon, may next proceed to open it in the following manner: Two stout loops of thread are passed through its wall by means of handled needles, at a distance from each other of about three parts of an inch. The intestine being raised by these, and held by an assistant, is punctured between them, either by a trochar or by the cautious use of a scalpel, when it speedily subsides from its state of distention by the prompt escape of air and fluid fæces. This opening having been enlarged simply by a vertical incision, or by a crucial one, by means of a probe-pointed bistoury, and the abundant escape of fæces having subsided, the opening in the gut is to be drawn outwards and fastened to the edges of the wound by four points of the interrupted suture.

Experience has shown that the direction and position of the incisions as above described best accomplishes the object in view, and are to be preferred to Callisen's, who made a vertical incision along the anterior edge of the quadratus, between the crest of the ilium and the last rib.

In the after-treatment the patient may be laid on the back, the wound being covered by warm wetted flannels admitting of easy and frequent removal, and the bowels should be moderately supported by a flannel roller, either from the first or after the lapse of twenty-four hours. Opium is to be given immediately, and persevered with in doses of a grain every four hours, or oftener, for the first few days.

The diet should consist of milk and gruel, with brandy, and any tendency to sickness may be allayed by the use of ice.

Any difficulty in the escape of the fæces through the new anus must be regulated by the careful use of warm water injections.

On the subsidence of irritation, and on the acquiescence of the constitution in the new order of things, the diet should be regulated by the same rules that have been already laid down when speaking of the second stage of the disease. Above all things, cleanliness is to be recommended.

The three following cases, in each of which I have performed Amussat's operation, will amply illustrate the symptom, progress, and treatment of ordinary cases of this disease.

M. A. M., *æt.* 35, a married woman, was admitted under my care in the Hospital, May 31st, 1864, on account of obstruction in the bowels. Five weeks since she lost her appetite, and felt ill, but was without pain. Up to this time she never suffered from constipation. A week later she observed some difficulty in the passage of flatus, per anum. This caused her to inspect the motions, when she found them to be composed almost entirely of blood and slime. Such motions passed, with some pain, two or three times daily up to May 19th, since which date nothing whatever has escaped. She began now to have pains about the belly, increased at night, and to be worn from want of sleep. On the 26th she became sick, the matters vomited being of a greenish hue. On the 28th, Mr. Griffiths, surgeon, of Nechells, examined her, and finding a stricture within the rectum, advised her removal to the Hospital. There is no history of cancer in her family.

Actual condition.—The patient has a haggard look, her complexion sallow in the extreme, heightening a general expression of distress. Frequent vomiting of greenish-coloured matter, having a stercoraceous odour, is present. Tongue, dry; pulse, 100; abdomen, tense and tympanitic, and a good deal swollen and tender to the touch. On examining, per rectum, the finger, about three inches within, came in contact with a hard tubercular immoveable mass. By a little searching, the finger lighted on a narrow passage, apparently about one inch in length, stretching onwards through this towards the intestine above. A little blood and slime came away after this examination, but no fæces.

Mrs. M. and her husband having urgently desired that I would make an attempt to relieve her suffering, on June 2nd I proceeded to open the descending colon in the left lumbar region, after Amussat's plan. This was accomplished without any difficulty, and at once allayed pain by the escape of abundant flatus and some fæces. The colon was not, however, much bulged into the wound, and did not effectually pour out its contents until some hours afterwards. The vomiting having entirely ceased, the abdomen was directed to be gently rubbed with warm oil, with the view of promoting evacuations.

June 2nd.—The vomiting recurred. In the afternoon a tube was passed along the transverse colon from the wound, and some gruel injected. A few hours subsequently she became easier, and considerable action of the bowels took place. Tongue, dry; pulse, 128 to 130. Opium, wine, brandy, and milk.

June 4th and 5th.—Much the same. Motions of a better colour.

June 6th.—Condition improved. Took some little solid nourishment, and was free from both sickness and pain.

June 7th.—Breathing affected. After this there was no more improvement, and she died at two o'clock p.m. on the 12th, eleven days after the operation.

Dissection twenty-four hours after death. Body emaciated; skin of marked yellow colour. Head: brain, natural. Thorax: heart, natural. Lungs: the whole lower lobe of the right lung and a good part of the upper in a state of grey consolidation. The lower lobe of the left lung was similarly affected. There was no deposit of cancer in the lungs or in the thoracic glands. Abdomen—liver: the anterior margin of the right lobe contained a mass of deposit, having all the appearances of encephaloid cancer. Several similar deposits of various sizes were scattered throughout the substance of the organ. The kidneys, spleen, and mesenteric glands were natural.

Peritoneum slightly injected, but without any traces of effused lymph or of adhesions, except at the seat of the wound. The small intestines and cœcum contained a good deal of air, the latter more especially so; the large intestines were empty and healthy in all respects up to the artificial opening; the lower part of the sigmoid flexure contained some light-coloured fœcal matter.

Examination of disease.—A cancerous mass surrounded the rectum for three inches, commencing about the same distance from the anus. It occupied the muscular and areolar coats, lying external to the mucous membrane. The passage in the bowel was contracted by the pressure and growth inwards of this to such an extent as only to admit a crowquill. Just below the commencement of this was a small spot where the disease had broken through the mucous membrane, forming an ulcer the size of a sixpence. The cancer was white and firm, containing many intersecting bands of fibrous tissue, and presenting generally the features of scirrhus.

The uterus was normal in size and appearance, but had a little white tubercle, about the size of a pea, under its serous coat in front, and a smaller one behind. The ovaries contained large simple serous cysts, the left one being altogether about as large as an orange.

G. M., *æt.* 42, a small, dark-haired man, a coal dealer by trade, was admitted into the Hospital under the care of my colleague, Dr. Russell, March 10th, 1865, on account of an obstruction in the bowels.

History.—For six years has been in the Australian gold-diggings, and during that period suffered from two attacks of diarrhœa. Six months since his health began to fail, and he was soon compelled to give over work. Emaciation next set in, and he became greatly reduced. Up to three months ago he never perceived anything to be the matter with either his bowels or stomach, the former acting regularly. At this time a quantity of clear water began to rise in his mouth, generally about two or three hours after breakfast and dinner, as much as half a pint at a time. About the same period vomiting occurred, at first about ten minutes after meals, but latterly no food of any kind has remained on his stomach. Constipation was also now present. There was pain generally over the abdomen, and a discharge of mucus very frequently, per anum, accompanied by pain. Has passed but two motions during the last six weeks, the last being about a fortnight since. He had prolonged difficulty in voiding this; it was, however, most copious, and accompanied by a good deal of slime. Blood had never been observed to escape.

Two days after his admission I was requested to see him.

Actual condition.—Patient very feeble, greatly emaciated, pulse small, colour of skin not unhealthy.

Abdomen considerably, but not tensely distended, symmetrical, no fluctuation, no local dulness. The loins posteriorly alike; the left rather the flatter, and decidedly the less resonant. There was no special resonance in either loin, and no fulness. From the rectum a little pearly mucus was observed discharging. On introducing the finger within the anus an obstruction was at once detected within easy reach. It appeared as if the lining of the gut was unaffected, the growth lying external to it, situated in front, and admitting of the finger being passed somewhat behind it. An attempt to pass an O'Byrne's tube succeeded so far as passing this obstacle was concerned, but no motion followed the injection. There was incessant vomiting of a dark greenish fluid.

The patient having expressed his urgent desire to submit to anything that would afford him even temporary relief, after a consultation I resolved to open the descending colon.

Accordingly, on the 14th, in the presence of Dr. Maurice Colles, of Dublin, who happened to be visiting me at the time, as well as of my colleagues, the descending colon was easily brought into view after the ordinary incisions. Whilst feeling with the finger the limits of the free portion of the gut the finger came in contact on the vertebral border with a hardened ridge. Everything being sufficiently clear, and the bowel being penetrated by a strong thread to fix it, I passed a needle with the view of stitching its lower border to the margin of the wound; in doing so an instantaneous escape of serous fluid took place. Finally, the bowel being fastened, it was opened, and slowly an escape of abundant soft fœcal matters took place. The patient bore the proceeding remarkably well, and expressed himself as feeling greatly relieved. I noticed that some serous fluid escaped alongside of the fœcal matters on his being laid on his back in bed. Some few hours afterwards he was very comfortable. All sickness subsided. He took freely brandy and milk. A grain of opium was administered every two hours, and fœces flowed several times.

15th.—Expressed himself cheerfully. Was entirely free from pain. There was no swelling of the abdomen, and not the least sickness. The pulse was, however, quick and very feeble. Urine passed in good quantity. He died on the morning of the 16th.

Dissection forty hours after death. There was general and advanced emaciation. The abdomen contained a considerable quantity of fluid of a deep bilious colour; interspersed were some few flakes of lymph, but there was no blood. The intestines were quite free from distension, the small intestine being much contracted and the colon nearly empty. Of the seat of operation, the cellular connections of the gut were seen to be unaltered. There was no extravasation of blood about or indications of inflammatory action. The stomach was contracted to fully one-half its normal capacity, its walls being generally rigid and thickened. The mucous membrane was entire everywhere, but coarse and granulated. The thickening was more marked at the orifices, forming in each instance a decided stricture, though by no means a close one.

At the pyloric valve the wall was fully half an inch thick, dense, and resisting. The thickening ceased abruptly at the valve, the duodenum being healthy.

Around the cardiac orifice the increase in thickness was somewhat greater, but it diminished more rapidly; it extended a short distance at the œsophagus, surrounding the terminal part of that tube. The other portions of the stomach varied in thickness from one-eighth to one-third of an inch. The various coats were generally distinct, except at the strictured portions, where they were blended together.

The tissue at the orifices was of a whitish-grey colour in different parts. The pyloric portion presented, on examination, an abundance of cells furnished with good sized nuclei; the cells were, the majority of them, spherical, averaging the $\frac{1}{1\,5\,0\,0}$ part of an inch, many angular or oval from $\frac{1}{1\,1\,0}$ downwards. Its physical appearance was eminently characteristic of scirrhus cancer. The gastro-hepatic omentum was contracted and thickened, and converted into a hardened mass containing the vessels and ducts in connection with the liver. It contained also numerous enlarged glands, in structure and appearance identical with the deposit in the stomach. The gastro-splenic omentum was similarly affected, being drawn close up to the stomach, as was also the left kidney—a mass of hard cancerous matter resting on its upper end. The small and large omenta were much corrugated, and were occupied universally by myriads of small isolated nodules of hard white cancer.

A chain of enlarged and infiltrated glands ran along the spine into the pelvis.

The lower inch of the rectum was healthy, forming a short loose pouch, terminated abruptly above by a hard prominent ridge projecting in part into the gut. This ridge was formed by a considerable thickening of the front wall of the rectum, forming a mass anteriorly, which conveyed to the finger the feeling of a tumour. The coats of the intestine were here half an inch thick for a distance of two inches; this thickening diminished at the sides and behind; above, for some four inches, were many nodular masses narrowing the width of the tube. The mucous membrane was everywhere healthy. On section, this thickening presented a yellowish-white colour, involved all the coats save the mucous, and generally resembled the disease in the pylorus.

The meso-rectum and the fold of peritoneum belonging to the sigmoid flexure of the colon contained numerous infiltrated glands, and a hard cancerous ridge ran along its attachment to the bowel.

The remainder of the intestines were healthy.

There were no other deposits of cancer observed.

In no place was the cancerous matter in the least degree softened.

My colleague, Dr. Bell Fletcher, asked me to see the following case. C. P., *æt.* 50, an emaciated, anxious-looking woman, a widow, who had been admitted into the Hospital, September 24th, 1861.

Married late in life, she became the mother of one child seven years ago, and had once miscarried since. Menstruation had always been regular. Her general health had been good. In the early part

of last May she began to suffer from griping pains in the bowels, followed by constipation. No medicine relieved her. In August she became an out-patient. Her stools at this time were very sparing; indeed, during the last four months she has scarcely passed any at all. Three weeks since she began to vomit everything that she took. For the last seven weeks her motions have been wellnigh entirely suppressed—the only evacuation being a slight stool four weeks since. Sleep has been entirely absent, owing to the excruciating abdominal pain.

Actual condition.—Abdomen enormously distended and painfully tympanitic. There is no prominence in either lumbar region. The finger passed within the rectum falls into a dilated pouch, at the upper part of which, and almost out of reach, a narrow stricture with surrounding hardness can be felt. Incessant vomiting of a watery fluid with mucus and bile.

September 28th, 12 30 P.M.—The patient having cheerfully assented to any proceeding likely to afford relief, I made the necessary incisions to expose the descending colon, after AMUSSAT's plan. The bowel was brought into view without difficulty, and about three pints of highly offensive fœculent material evacuated. The bowels being fastened to the edges of the wound and a roller passed round the belly, she was removed to bed expressing herself as greatly relieved by the operation.

Six P.M.—Is free from pain with the exception of a little burning sensation in and about the wound. Has not vomited since the operation. Since the opening was made in the intestines the discharge of fœces has never entirely ceased, there always being some oozing, and at times a motion. Her abdomen is much lessened in size. Brandy and opium have been freely administered.

26th.—Face cheerful. No sleep, but drowsy. Complains of pain in the wound, but not elsewhere. Pulse 108. Four distinct stools have passed during the night. Urine copious. Took beef-tea and milk freely. At 10 P.M. complained of griping pains in bowels, and there was some degree of tenderness.

September 27th.—Had some sleep during the night. Face blanched. Pulse 108, feeble; skin clammy. Abundant fœcal matter from artificial opening of a lighter colour. Æther mixture, with opium. Wine and beef-tea. Towards evening she wandered, and the abdomen became very tympanitic.

28th.—The evacuations were not so abundant this day, but towards evening they again became copious. Symptoms of prostration marked.

29th.—Scarcely any stool passed this day. Sinking.

30th.—At 11 A.M. died.

Dissection twenty-four hours after death.

The head was not examined. Thorax.—Contents natural. Abdomen.—There was no effusion in the peritoneal cavity. The various coils of intestine lay naturally, parts of their surfaces presenting præternatural vascularity, but without the effusion of lymph between their opposed surfaces.

On tracing the colon from its head it was seen to lie in its natural position, and to be empty. Around the seat of operation there was marked injection of the peritoneal coat of the intestine; and on separating the descending colon from its bed in the loin, some small deposits of pus were brought into view. On examining the small intestine, a loop of ileum, distant about six inches from its termination in the cœcum, was seen to lie in the hollow of the sacrum, firmly adherent by a dirty, sloughy portion to a protruding mass of scirrhus connected with the rectum. The finger, passed up through the anus, traversed the stricture in the rectum, and through it slipped into the abdominal cavity, breaking down the adhesion of the loop of ilium which sufficed to close this ulcerated opening against the entrance of the contents of the bowel into the cavity of the peritoneum. On examining the bowel there is a scirrhus deposit in the coats of the gut, occupying about four inches of the length of the intestine. The lowest point to which the deposit reaches being eight and a half inches from the anal aperture.

The malignant matter lies chiefly between the mucous and muscular coats, although the peritoneal covering is considerably infiltrated. This malignant deposit is of the scirrhus kind. The calibre of the bowel at this point is very much diminished, gradually contracting till it admits nothing thicker than a goosequill. A little below the middle of the diseased mass the bowel has ulcerated through all its coats, and there is an adhesion, with considerable plastic exudation around, between the terminal part of the ileum, where it passes into the cœcum, and this ulcerating part; and it is obvious that the iliac part of the bowel at the site of the adhesion was also rapidly progressing towards ulceration.

Above and below the constricted part of the bowel there is considerable dilatation; though the dilatation is greater in that portion of the bowel below the diseased mass than above it.

There was little or no malignant deposit in that piece of peritoneum forming the recto-vesical pouch. The artificial opening was situated sixteen and a half inches from the highest point to which the malignant deposit reaches; and from that opening downwards to the site of the disease, the bowel seems tolerably healthy. That portion of the tube eight and a half inches in length, between the diseased mass and the anal aperture, is also healthy; although, as before said, considerably dilated.

CHAPTER V.

SCIRRHUS OF THE THYROID GLAND.

IN a very large majority of the cases in which scirrhus attacks the thyroid gland it is a part of a more general disease, and we find cancerous deposits in the cervical glands, the breast, lungs, or other parts. In these cases, little or no doubt can arise as to its nature, and it is of but little interest or importance to the surgeon; not so, however, in those extremely rare instances in which it attacks the gland primarily, and in which, during the whole course and progress of the case until death occurs, it is uncomplicated with any other cancerous affection. In these cases—few though they be—the disease becomes of extreme interest to the surgeon, inasmuch as the recognition of its true nature will in all probability be attended with great difficulty, and questions as to its treatment will arise which would not be entertained for a moment in the class of cases to which I first referred. The following case is an excellent illustration of these observations:

On October 6th, 1862, I saw, at the suggestion of Dr. Heslop, Mrs. ——, *æt.* 47, who had been the subject of an enlarged throat for ten or twelve years.

She was married at eighteen, and became the mother of five children, her youngest child having been born in 1843. For the greater part of her life her health had been robust, but, under great anxieties, during the past fifteen years she had suffered severely from hysterical attacks, and during the last three or four from profuse discharges at the menstrual periods. In April, 1862, a difficulty in breathing was observed in walking up-hill. Slight hoarseness of voice became apparent, and constant attempts were made to clear the throat. She also complained of some difficulty in swallowing. In July and August there was a marked change in voice, and greater difficulty in breathing. Exposure and mental emotion would bring on paroxysms of dyspnœa. Early in September she had a frequent dry cough. She sometimes expectorated small quantities of blood. This was followed by an aggravation of her symptoms, and by great debility.

Actual condition.—There were present all the symptoms of extreme constriction of the larynx. The breathing was stridulous: at times so difficult as to be violently distressing, and with the voice reduced to a whisper. Over the situation of the thyroid cartilage lay what appeared to be a hardened and enlarged thyroid body. The top of the thyroid cartilage could just be felt. The tumours involved the right side and isthmus of the thyroid gland; it was tender to the touch. An immense vein was visible over the free portion of the trachea, but otherwise the veins in the neighbourhood were not enlarged. The patient showed signs of suffering in her face, but otherwise she was altogether unaffected. There was no wasting.

We were of opinion that the disease was scirrhus of the thyroid body. The severity of the symptoms was in some degree mitigated by the treatment adopted, but there was no real improvement, and the question to be determined by Dr. Heslop and myself was whether tracheotomy should be performed. We placed the matter thus before the patient and her friends.

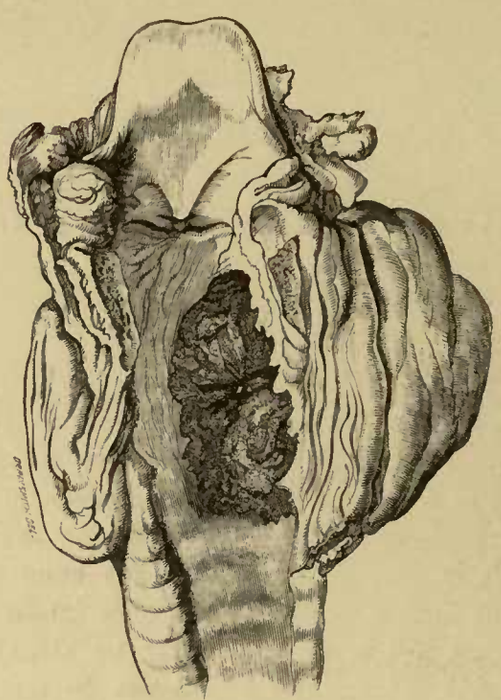
We were of opinion that, under any circumstances, the disease would, before long, prove fatal. This termination might take place at any moment.

The operation of tracheotomy, in this instance eminently hazardous, owing to the enlargement and thickening of parts, might prolong her life for a short period. We could not recommend its being

performed. At the same time I expressed my willingness to undertake it, if the patient desired it, in the knowledge of her case and its chances. The patient declined the operation, and, without wasting in flesh, she gradually became exhausted, her mind wandered, and she died on 23rd October, 1862.

Dissection twenty-four hours after death. The body had not in any degree wasted.—*Thorax.* Lungs and heart healthy. At the apex of the right lung was a pucker, and in it was contained a cretaceous-looking body as large as a pea.—*Abdomen.* Organs generally perfectly healthy. The right lobe of the liver presented, at its free edge, a single tubercle of scirrhus-like hardness, and not larger than a hazel nut.—*The neck.* The glands along the edge of the sterno-mastoid on right side were enlarged and hardened, but did not contain any cancerous material. The tongue was natural. The right lobe of the

Fig. 2.



thyroid gland was as large again as the left. It was of stony hardness, and lay on the side of the thyroid and cricoid cartilages, and three upper rings of the trachea. The left lobe was not larger than usual, and had the appearance of its natural structure. On opening the larynx, a ragged excavated foul ulcer was brought into view, situated about a quarter of an inch below the inferior vocal cord of the right side. This ulcer was an inch in length by half an inch in breadth. On tracing its origin it was seen to be the result of the progress inwards of the disease in the right lobe of the thyroid. The contiguous portions of the thyroid and cricoid cartilages were entirely absorbed, being occupied by a firm scirrhus mass, which had broken down in its centre, and made its way inwards by ulceration in the way that has been described. Fig. 2.

Physically and microscopically the tumour presented the ordinary characters of scirrhus cancer.

The limitation of the disease to the isthmus and one side of the gland is worthy of notice. I believe it to be the rule rather than the exception in cases of primary scirrhus cancer affecting this gland. I am disposed to ascribe the extreme dyspnœa under which the patient laboured not so much to the ulcer in the larynx, or to the pressure of the tumour thereon, as to its interference with the adjacent pneumogastric and sympathetic nerves.

The fact that the patient had undergone no emaciation whatever, and presented no symptoms of the cancerous cachexia, notwithstanding the long duration of the disease, is very remarkable. The true explanation of it is probably to be found in the extremely limited character of the cancerous affection. It may not incorrectly be considered as a purely local disease, causing death by its local effects, rather than as the expression of a constitutional disease.

The chief points to be attended to in the diagnosis of primary cancer of the thyroid gland are the following:

In the first place, it will be found that, as a rule, scirrhus affections of the gland grow much more rapidly than fibrous, enchondromatous, or other tumours that are likely to be met with in this region.

Secondly. As a consequence of this more rapid growth, they are almost always attended by more severe and more constant pains than other tumours.

Thirdly. The scirrhus tumour contracts much firmer and more extensive adhesions to surrounding parts.

Fourthly. The scirrhus tumour can very seldom be moved up or down, or from side to side, *on* the larynx, as other tumours can; but the tumour and the larynx from their intimate adhesion appear to form one mass.

Lastly. Attacks of dyspnœa occurring in paroxysms, and often of great severity, are of frequent occurrence in malignant affections of the thyroid gland. When the benign tumour affects the respiratory functions it is generally from mere pressure on the trachea and larynx, and the difficulty in breathing is less paroxysmal.

CHAPTER VI.

ENCEPHALOID GROWTHS.

THE clinical characters and general history of encephaloid growths have been sufficiently described in Chapters I and II of this treatise. I shall now proceed to illustrate them more fully by a detailed account of their symptoms as they affect the various organs and structures of the body, commencing with

ENCEPHALOID TUMOURS OF THE CRANIUM.

Encephaloid or fungous tumours, apparently growing from the surface of the cranium, may have their origin either from any portion of the bone itself, or from the membranes or substance of the brain. When they arise within the skull they gradually perforate the bones, and make their way outwards, and in many cases it is with very great difficulty that they can be distinguished from those that spring from the bones. After a time the skin covering them gives way, and a spongy bleeding fungous mass protrudes, which grows rapidly, and soon terminates in the death of the patient. In their early stages these tumours are of small dimensions and immoveable, and they are usually free from pain for a considerable period. When they originate within the skull they have generally a distinct pulsation; the orifice in the bone through which they have protruded is not always to be distinguished, owing to the bulging of the growth over its margins.

Their origin is very frequently at the seat of some blow or injury, as in the cases of B. A. and J. J., related below.

I have had the opportunity of observing three cases, which will well illustrate the history and course of these growths. The first of these is an example of the disease springing from the cranial bones; the other two originated within the skull.

B. A., *æt.* 27, married, a woman of worn appearance, with an infant five days old at her breast, by occupation a guard-chain maker, was transferred to my care in the General Hospital, Birmingham, from my colleague Dr. Bell Fletcher, December 19th, 1855, on account of a large growth arising from the right side of the cranium.

History.—Fourteen years since she received a wound on the right side of the head from a press, at which she was working. The wound bled freely at the time, and she bound it up and it soon healed. Two years subsequently to this she perceived a slight swelling in the situation which the wound formerly occupied. This increased so gradually that no notice was taken of it, till at the end of eleven years it had reached the size of a hen's egg. Up to this time it had been painless. Now it became painful, and a rapid increase took place in its dimensions. She became an out-patient of the hospital, but did not derive any benefit from treatment. At this time the tumour was of an oval shape, and measured about two inches

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by four and a half, its long diameter being from before backwards. About four months ago a second tumour arose between the first and the middle line of the head, situated rather nearer to the forehead than the first. This rapidly attained a corresponding size, and was followed by a third elevation placed behind, which in a little time presented the same characters as to growth and shape.

The patient states that she has always had good health. All her blood relations are healthy people; and she is not aware of any of them having suffered from tumours. She is herself the mother of four children beside the one she is now suckling.

Present condition.—The parts occupied by the disease may be limited by a line drawn from before backwards, starting from the central aspect of the os frontis along the sagittal suture to its junction with the lambdoid. From this point downwards, at right angles to the first, a second line may extend to the mastoid process, and from this a third to the malar bone, a line thence upwards to the os frontis, completes the boundaries. Within these are included the right parietal bone, the right temporal above the zygoma, the greater wing of the sphenoid in the temporal fossa, and the right half of the frontal to within an inch of the orbitar margin.

The tumour from this extensive origin rises abruptly and irregularly upwards. It yet retains its original character of a threefold development, and presents three elevated masses or nodules separated from each other by deep furrows. Two of these are side by side in front, and the third is behind. They severally arise by a common base of origin, consisting of a firm even enlargement of the bones beneath. The scalp covering this is but little altered in appearance with the exception of the loss of hair and the presence of many enlarged veins, but the nodules are covered by a thinned integument of a shiny character, pinkish in colour, and very fragile in texture. (See Plate 5.)

The greatest height of the disease from the surface of the cranium is about five inches.

There are no glandular enlargements about the body.

She complains of severe headache and of inability to sleep at night.

On the 5th of January she complained of loss of sensation in the centre of the chin and a tingling feeling down the right cheek. The eyesight was very imperfect, and the veins over the forehead and anterior aspect of the tumour were enlarged.

January 9th.—The thin covering of the more prominent masses yielded, and the patient lost nearly a quart of dark blood before the flow could be arrested. Acute pain was experienced at the back of the head. A concentrated solution of alum was applied to the source of hæmorrhage.

12th.—There is discharge of an offensive character from the parts that have given way. Considerable hæmorrhage recurred towards night.

19th.—The disease is growing rapidly. Protrusion of a soft fungous-looking structure has taken place in several spots, and large masses slough off and discharge.

27th.—Sight almost gone in the right eye, the pupil being somewhat narrower than the left; numbness still existing in the centre of the chin.

31st.—Excessive bleeding—restrained by turpentine applications. Intense pain across the forehead and right temple.

February 2nd.—Deafness on the right side and complete loss of sight. From this time there was a daily recurrence of the hæmorrhage. The appearance of the unhappy patient was miserable in the extreme. The tumour grows with extreme rapidity, and now rears itself directly upwards for about seven inches above the level of the skull, overhanging the brow, and exceeding in dimensions the size of head and face together. New portions from within press outwards, the sloughing surfaces keep up distressing discharges of blood and matter. (See Plate 6.) For a few days before her death she was insensible, and at length she sank, worn out, on the 16th of February.

Dissection twenty-four hours after death.

Thorax.—The right lung adhered to the diaphragm by old bands—the left was perfectly free. There was no fluid in the pleuritic cavities. On removing the contents of the cavity for inspection, a large mass of encephaloid deposit was seen to occupy the situation of the bronchial glands, about the bifurcation of the trachea and the arch of the aorta: many of these glands were enlarged and similarly affected.

The surfaces of the lungs generally were occupied by small cancerous growths, varying in size from that of a small pea to masses of an inch or more in diameter. These larger deposits were more numerous on the posterior surfaces of the lungs. On section, the substance of the organs presented many scattered cancerous deposits completely separated from each other, and surrounded by healthy-looking lung. The costal surface of the pleura was sprinkled generally with encephaloid formations.

Abdomen.—The liver, spleen, kidneys, and pancreas were pale and exsanguine, and free from any appearances of cancerous deposit.

The peritoneum.—The glands of the mesentery and of the lumbar regions were also free. There was an increase in the amount of fat about the kidneys and the folds of the peritoneum.

The uterus and ovaries were natural.

Cranium and disease.—

In order to avoid injuring the specimen an elliptical piece of bone was removed from the left half of the skull so as to afford a good view of the internal growth of the tumour, the brain being taken out slice by slice.

The advance of the disease internally had formed a growth of dense bony material, which had gradually shaped itself into a somewhat rounded projection upon the internal table of the calvarium. Its position corresponded accurately above and behind to the position of the right parietal bone, its extent *forwards* being a little beyond the coronal suture, whilst below it reached down the internal face of the squamous portion of the temporal and greater wing of the sphenoid, and terminated in the middle fossa of the base of the skull by a narrow portion distant about half an inch from the right anterior clinoid process.

The greatest depth of the projection inwards at any point was two inches. The surrounding bone was thickened, but otherwise it did not differ from the usual condition.

Stretched over this ossific surface were the remains of the dura mater. In places it had altogether disappeared, whilst in others it was undergoing a process of tightening and thinning until the fibres ceased to afford resistance to the onward march of the disease. The dura mater was not otherwise affected than by this mechanical separation and removal.

The surface of the brain beneath all this bore exact impress of the shape of the internal growth. The convolutions were massed together, and the pia mater and arachnoid membranes covering them were thickened and opaque. On section of these depressed portions, the cerebral structure was seen to be in a softened state, breaking up on the least degree of disturbance. In other parts the brain was unaffected by this softening; and, in truth, beyond its bloodless appearance, presented no other feature calling for notice.

Viewed externally, the morbid mass at the summit of the projections presented the usual appearances of sloughing tissues. Further in, sections of the tumour afforded the well-marked characters of medullary cancer, here and there altered by the infiltration of blood into its substances; whilst, deeper still, the knife was arrested by the solid base of bone from which the fungous portion of the tumour sprang.

By maceration, all the soft parts having been removed, a complete view of the skeleton of the tumour was obtained, as represented in Fig. 3.

Fig. 3.

The new bone was mainly of a light friable texture, formed of slender upright columns of bone closely arranged together in some places; in others wider apart, admitting of the interspaces being filled by the soft cancerous material. The free surfaces of this outgrowth externally were much more irregular and far more extensive than the corresponding ones internally; the former having given shape and consistence to the tumour, and having grown without restraint, whilst the latter had to make way against the contents of the cranial cavity.

In this case the disease appears to have arisen here from the compact substance of the cranial bones, as shown by the facility with which the dry bony growth can be removed from the outer or inner table of the skull, so as to lay bare the walls only slightly changed.

At no point does there appear to be absorption of the tables; but a corresponding growth from outer and inner tables, the outer being modified in aspect and character by its unrestrained opportunity of increase and by the deposit of encephaloid cancer in its interstices.

Reflection on the preceding case seems to point out the possibility of excision in the earlier stage—of removal of the disease from the external table of the skull; and should another case fall under my notice I should feel inclined to recommend the adoption of such a measure rather than relinquish all hope from surgery.

It is only indeed in a case having this origin that any operative interference for the removal of the growth could be thought of or effected.

PLATE VII

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J. J., *æt.* 51, a woman of anxious countenance and very pale, was sent to me at the General Hospital, by Mr. HOUGHTON, of Dudley, March 2nd, 1854, with a bleeding fungous tumour of the right side of the cranium.

History.—She states that about five years since, in stooping, she injured her head with the metal door of an oven. In healing, the wound left a lump of the size of a nut, which gradually increased, with occasional pain, until six months since. At this time the tumour was punctured, the result being very free bleeding. Subsequently a protrusion took place at the seat of puncture, which rapidly assumed the character of a large growth and was the seat of repeated bleedings.

Present appearance.—The disease is seated on the right side of the cranium, and occupies a position corresponding to the posterior inferior angle of the parietal, and on either side to the adjacent occipital and temporal bones, being thus placed immediately behind the ear and overhanging the mastoid process. Its circumference at the base measures eleven and a half inches, while its free surface is somewhat more. The finger passed around its attachment traces its continuity from the parts within the cranium, and readily detects the vacuity in the bones through which the growth has passed. The scalp at the margins is stretched over them for a short distance, being lost on the free surface in the sloughing fungous material of which the growth is composed. Large masses of the tumour consist of dark, bloody infiltrations, whilst others have a suppurative appearance; all parts of the projection, which is between three and four inches in thickness, are characterized by rapid growth, by sloughing, and by frequent hæmorrhage. (See Plate 7.) The tumour pulsates with the brain, and is comparatively painless. There are no enlarged glands in the vicinity. There is no hereditary disease in members of her family.

During the stay of this patient in the hospital repeated bleedings took place, sometimes to an alarming extent, and were with difficulty only partially restrained by styptic applications and pressure. After the bleedings the sloughing process was extensively renewed, so that the strength rapidly gave way. Seeing no prospect of improvement, and alarmed at the thoughts of dying in the Hospital, she desired her friends to remove her, which they accordingly did on the 26th of May.

In this case it became necessary, in order to restrain the bleeding, to exercise very considerable pressure. This was accomplished by means of well applied compresses and bandages, and the result, so far as the hæmorrhage was concerned, was always satisfactory. But, I had in view to systematically compress the growth itself in the hope of possibly arresting its progress. For this purpose the compresses of lint were carefully covered with sheet-lead, and to the general shape of the tumour was applied a strong cap of gutta percha—the whole being accurately secured by double-headed rollers. The patient, however, could not sustain the compression beyond a few hours. The incessant growth of the tumour arrested by the bandage speedily compressed the brain itself, and headache and hot skin soon compelled its removal.

I tried this means over and over again during a three months' observation of the case, but I cannot say that any material delay was produced in the progress of the disease. Notwithstanding, in a similar case falling under my notice, and soon after the perforation, I should at once have recourse to the same plan of treatment, modifying it so far as to fix the compressing cap to the tumour and cranium by an elastic band which would be capable of yielding somewhat to the increase of the tumour and of exercising the least injurious kind of pressure on the brain itself.

When the growth has attained considerable dimensions, and the stage of sloughing and hæmorrhage has set in, no better application to the soft fungus can be found than lint dipped in the ordinary tincture of the sesquichloride of iron.

The obscurity attending the exact nature of these growths in an early stage, when unaccompanied by pulsation, and in the absence of being able to detect the margins of the perforated bone, is well displayed in the following case.

P. C., *æt.* 30, a polisher by trade, married, was admitted in the Hospital under the care of my colleague, Mr. BAKER, May 19th, 1865, on account of a tumour growing on his forehead.

History.—About six months since he for the first time noticed the appearance of the tumour; it was then no larger than a pea. He knows of no blow or fall that could have caused it, and he never had any illness save an attack of fever eleven years since. For the last three or four months he has suffered from headache and sickness. His wife states that she has noticed his memory deficient during the last two months, and that he has been dull and stupid.

Present state.—A strong, healthy-looking man. Commencing close to the right of the median line of the frontal bone, and about half an inch above the corresponding superciliary ridge, is situated a tumour of the shape and size of a hen's egg. It is of firm consistence, without pulsation, and the integument covering it is both unchanged and moveable. The patient complains only of a tightness about his forehead.

May 24th.—Under chloroform. The integuments covering the tumour being divided crucially, the growth itself was severed from its connexions with the parts beneath. It was then evident that it sprang from within the skull, and did not admit of further interference. Excessive hæmorrhage followed, which was with difficulty restrained by pressure with pads of lint soaked in a solution of the sesquichloride of iron. In the afternoon and evening following there was a good deal of bilious vomiting. The next day the sickness abated, but towards afternoon he became drowsy, and died at nine the same night.

Dissection twenty-four hours after death. On removing the scalp from around the situation of the growth, the skull was seen to be perforated by a rounded aperture measuring an inch and a half in diameter, and corresponding exactly to the size of the tumour. The edges of this were irregularly notched and serrated, the margin being raised externally above the level of the healthy bone, so as to obscure the detection of the opening during life, whilst, internally, they were bevilled off at the expense of the internal table. There was no adjacent thickening. The pia mater was somewhat congested. On raising the anterior lobe of the brain on the right side, the tumour projecting from the lateral aspect of the hemisphere was seen passing into the opening of the bone. The growth here perforated the dura mater, and at the point of escape, being somewhat narrowed by a little constriction, it assumed the appearance of having a pedicle connecting it with the rest of the disease. The growth itself had all the characters of a separate tumour of the encephaloid variety. It was as large as a small orange, and occupied the greater part of the anterior lobe. In its centre it was breaking up, but the adjacent brain was in a natural condition. The cribriform plate of the ethmoid, and the orbital plate of the frontal bones, were eroded by pressure. There were no traces of encephaloid deposits in other parts.

The attempt at extirpation of the perforating growths, having their origin in the meninges, or in the brain itself, has always been attended by a speedily fatal result.

In these cases, therefore, the use of the knife, or indeed of any means whereby the complete or partial removal of any of these tumours is contemplated, should not under any circumstances be sanctioned.

Diagnosis.—In the earlier stages of their growth, encephaloid tumours of the cranium may possibly be confounded with any of the following affections: (1) aneurism or erectile tumour of the scalp, (2) encysted tumours, (3) subcutaneous cancerous tumours, and (4) with certain cutaneous growths; but in the advanced stages of the disease it is impossible, with ordinary care, to confound them with any other affection—the only difficulty at that period is to determine whether they originate from without or from within the skull, and the point is of small importance so far as their treatment is concerned. In determining their nature in any doubtful case the surgeon must be guided in a great degree by the presence or absence of those general and characteristic symptoms of malignant disease which I have enumerated so fully in the first chapter of this work, and he must consider them in conjunction with the special symptoms and history of the growth which happens to be under his observation. It must be borne in mind that encephaloid tumours of the cranium, which originate from the bones of the skull, or from the interior of its cavity when perforation has taken place, are of very rapid growth, and that they are usually accompanied by some symptoms indicating in an unmistakable manner that the brain, or some of the nerves issuing from the cavity of the skull, are subjected to some unusual pressure; hence we have headache, impairment of memory, partial loss of sensation or motion, vomiting, &c. These symptoms sometimes occur even when the disease has originated from the bones external to the cranial cavity. This is remarkably illustrated by the first case I have related in this chapter, in which symptoms of pressure on the brain and nerves were produced by the deposit of osseous matter within the skull at a point corresponding to the external disease. Again, in the case of P. C., symptoms of cerebral disease were manifested within three months from the time when the patient's attention was first called to the local disease. Another point of great importance in the diagnosis of these growths when they originate within the skull and perforation has taken place, is the fact that they frequently pulsate synchronously with the respiratory movements. This sign is of extreme value when it exists, and will be sufficient to distinguish these tumours from any other kind; but great care must be taken not to confound it with a pulsation which may be met with in vascular tumours of any kind, and which is synchronous with the cardiac systole. The characteristic pulsation to which I have referred was present in a marked degree in the case of J. J. If the margins of the perforated bone

can be detected it would be decisive as to the nature of these tumours, were it not for the very rare occurrence of perforating aneurism of the meningeal artery in which the same conditions would exist. I will now enumerate the principal symptoms by which the diseases I have mentioned may be distinguished from encephaloid tumours.

(1.) Aneurism and vascular or erectile tumours. These pulsate synchronously with the cardiac systole only. Their size may be reduced considerably, and their pulsation stopped by pressure on the main arterial trunks supplying them. They may also be reduced very considerably in size by continued pressure. Again, they have, with the exception of aneurism, a tendency to extend by their circumference so as to cover a large surface, rather than to grow outwardly.

(2.) As to encysted tumours of the scalp, their history, progress, and special symptoms are usually so evident that it is a very easy matter to distinguish them, except under the circumstances presently to be mentioned, from malignant growths. They are very moveable; their growth is very slow; the skin covering them very seldom becomes affected; they are generally regular in shape, and never attain anything like the size to which malignant growths reach; and it will very commonly be found that other tumours of a like kind, and in process of formation, are scattered over the scalp. If, however, a solitary perforating growth of moderate size without any pulsation, in which the margin of the perforated bone cannot be distinguished, should be met with, it would doubtless be a very difficult matter, in the absence of any other evidence of cancerous disease or cachexia, or of the symptoms arising from pressure on the brain and nerves, to distinguish it from an encysted tumour of the scalp.

(3.) Subcutaneous tumours of the scalp exactly resemble the tumours of which we are now treating in the early stages of their growth. They invariably belong to the encephaloid variety of cancer, and are accompanied by the usual constitutional symptoms of malignant disease. They grow with great rapidity; but as far as my own experience of them extends they are always multiple on the scalp, and they are all also either preceded, or followed at a very early period, by similar growths in the subcutaneous tissue of other regions. Whereas it is a remarkable fact that the encephaloid tumours of the cranium are seldom, if ever, accompanied by similar growths in any external part of the body. The subcutaneous tumours never attain anything like the size of the growth springing from the skull, or from the brain.

Lastly. There are certain growths springing from the skin, some of them of a malignant and others of a benign character, which it is difficult under certain circumstances to distinguish from encephaloid cancer of the cranium. These have a tendency to extend in circumference rather than to grow outwardly, to form flat elevations rather than distinct tumours. They are, in their earlier stages at least, freely moveable upon the skull. Whether they are malignant or benign they generally spring from some mole or other congenital mark. In a large number—probably in the majority of cases—it will be found that these growths have existed for years in a quiescent state, and that some slight injury, or some constitutional cause, has caused them to develop themselves with great rapidity. Their tendency is after a time to ulcerate, rather than to increase in circumference and depth. The case I am about to relate is an excellent illustration of the malignant form of this disease.

W. J., *æt.* 56, a strong, vigorous-looking man, by occupation a stonemason, was sent to me by Mr. Blanshard, of Wolston, and admitted into the Hospital on March 13, 1863, on account of a large growth from the upper part of the head.

History.—At birth he had a very small strawberry-like formation on scalp. This continued without change until fifteen years ago, when it became a little warty in character, and he was in the habit of picking off the scab which formed on it from time to time. Since this period it has increased slowly and gradually up to within five months of this time, when, after a severe cold, a rapid enlargement occurred, and it speedily attained its present dimensions and appearances. Except a lotion, he has not applied anything to it, and he has never suffered pain. There is no history of cancer in his family, and his own health has always been good.

Present condition.—The growth is situated at the junction of upper and posterior angles of the parietal

with the occipital bones. The base is irregular in shape, rounded and protruding, soft to the feel, and covered by healthy scalp. The centre of this is occupied by an ulcerated surface, measuring two-thirds of an inch in breadth, having small healthy-looking granulations covering it in regular masses, overlapping at the edges, and being somewhat excavated in the centre. The entire mass is elevated from the level of the skull about two inches, and appears moveable on the pericranium. There are no glands enlarged.

Fig. 4.

On March 16, I cut the growth away from its attachments, slicing it off at its base, without any attempt to preserve the scalp on the unbroken portions, as I felt it would be impracticable to separate it for any future use from the disease beneath. The hæmorrhage from all parts was excessive, so much so that I speedily abandoned all attempts to use the ligature, and at length effectually controlled it by the actual cautery.

On examination the growth presented the appearances of malignant disease, and had evidently originated in the skin, to which part its extensions were confined. The more elevated parts at the base appeared to consist of mere thickening of the integuments and adjacent loose cellular membrane.

The patient recovered strength well, and on his discharge, April 18, a wound, covered by healthy granulations, about as large as a five shilling piece, alone remained.

At the end of June his general health was still good, but the granulations were sprouting upwards, and were at once destroyed by the actual cautery.

Mr. Blanshard informs me that the edges of the wound became cancerous some time after his discharge, the disease extended nearly to the ears, and he died on the 12th of October, 1864.

In the benign variety of these growths we very generally observe some remains of the natural structure of the skin, and hairs not unfrequently grow from their external surface. The following case, which has somewhat recently fallen under my notice, will serve to illustrate these remarks; and if the woodcut be compared with Plate 7, it will be evident that the one disease might readily be mistaken for the other in the absence of any of the characteristic symptoms of the cranial or inter-cranial growths.

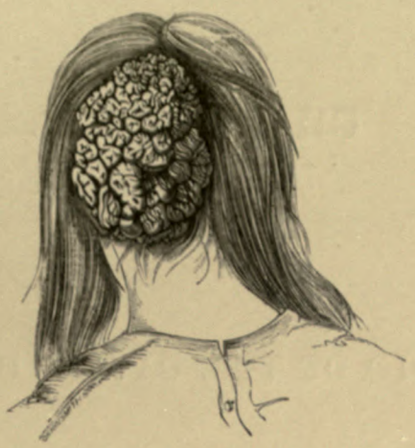
A. M. R., an interesting, intelligent girl, *æt.* 16, was sent to me by Mr. T. Underhill, of Great Bridge, April 4th, 1862, on account of a large growth situated at the posterior part of the cranium.

History.—When she was born her parents state that the tumour was of the size of a walnut. It increased very slowly until she was twelve years of age, since which period it has grown very fast. It has been free from pain and uneasiness of every kind. When she was about ten years old she suffered from chorea, but in other respects she has been healthy; she commenced menstruation two years since. Her mother states that during her pregnancy she had a dream in which it appeared that her child was born with the brain outside the head. The family history was without importance.

Present condition.—The tumour is placed on the left side of the cranium, stretching backwards so as to cover a small part of the temporal and posterior inferior part of parietal and two-thirds of the occipital bones. The ear is pushed outwards, but otherwise unaffected by the growth. In appearance it is greyish white, and resembles very accurately the arrangement and general appearance of the cerebral convolutions. (Fig. 5.) In the centre of many of the convolutions are stellate impressions, from which short strong hairs grew. The entire mass is very firm, moveable on the scalp as a whole, and is about four inches in thickness at its most prominent part. There are no glands enlarged in the vicinity. The surface of the scalp in other places, the neck, lips, hands, trunk, and legs, are freely covered with brownish moles.

April 23rd. Under chloroform I carefully and rapidly dissected off the growth from the pericranium. The hæmorrhage was excessive, and thirty vessels were secured by ligature as quickly as possible. The patient was faint and exhausted for hours, and rallied with difficulty.

Fig. 5.



After a time she did well, and left the Hospital at the end of June with the wound nearly healed.

On July 21st she came to show herself, and a sound cicatrix of very moderate extent alone marked the seat of the disease.

CHAPTER VII.

ENCEPHALOID OF THE CAVITY OF THE NOSE.

CANCEROUS or malignant polypus frequently arises in the nasal passages. It is true encephaloid cancer.

At first the patient is sensible merely of an obstruction in one nostril, sometimes attended by an ichorous and sometimes by a bloody discharge.

Before the polypus has made a certain progress it will be difficult for the surgeon to determine its nature; there is little difficulty subsequently.

It appears as a soft, spongy, livid substance of rapid growth, which speedily takes possession of one or both nostrils. In its further extension the nasal bones are separated, the soft palate is pushed downwards, lateral prolongations take place into the maxillary sinus, and its final course is made manifest by protrusions on the cheeks and upliftings of the orbits.

Attendant on these conditions the voice becomes muffled, the smell lost, respiration and deglutition are impeded, and even sight and hearing are impaired; the adjacent lymphatics very often and very early enlarge, and death takes place either by suffocation or exhaustion.

The following case displays the nature of this disease, and in the early age at which it appeared affords a striking illustration of one of the marked peculiarities of the encephaloid cancer.

J. B., *æt.* 5, a strumous-looking child, was admitted into the Hospital August 16th, 1849, under the care of my late colleague, Mr. AMPHLETT.

History.—Thirteen months since, soon after recovery from measles, his mother noticed a change in his utterance, accompanied by stertorous breathing, especially during sleep, and by a constant discharge from his eyes and nose. He was placed under surgical treatment, and a growth, which had become evident in his right nostril, was removed by forceps.

Present condition.—The right nostril is seen to be slightly pushed outwards, and its cavity to be occupied by a soft, vascular polype-like growth; a similar formation partially fills the left. Within the mouth the soft palate is depressed by the disease, and the finger pushed far backwards detects a large mass of morbid structures, occupying and closing the posterior nares. The boy is distressed in appearance; he hears imperfectly, and is dull and stupid, and deglutition is somewhat embarrassed. There are no enlarged glands.

In the course of a few days Mr. AMPHLETT broke down and detached large masses of the disease with the ordinary polypus forceps to such an extent as to obtain a free passage into the throat.

On examination the detached portions presented the appearance of encephaloid cancer.

After this the boy improved in health and increased in flesh, but in three weeks the tumour had regained its position and size. In the mouth the palate was more depressed, the distension of the right nostril and root of the nose became more evident. His face assumed a yellowish cast, whilst deafness and a disposition to sleep marked the progress of the disease.

These symptoms were again temporarily relieved by the use of the forceps.

Six weeks after his admission into the Hospital his emaciation and distress were extreme. The

interval between the eyes enlarged, and the floor of the right orbit became elevated. The child was in a state of perpetual stupor, eating mechanically and swallowing with difficulty. At times respiration was alarmingly affected, and the voice was reduced to a whisper.

On the morning of the 23rd of October he became suddenly worse. He drew his breath at prolonged intervals, there was marked lividity of the face, and he appeared to be dying.

On looking into his mouth I was struck by a marked increase in the depression of the soft palate and consequent narrowing of the breathing space. The stretched velum was so tense that it seemed as if its division would afford some temporary relief.

I accordingly divided by a rapid stroke of the scalpel the entire velum close to its attachment to the bony palate, and, grasping with the fingers the protruding disease, pulled it away in large quantities. There was scarcely any bleeding; a large space was cleared, and the boy breathed more easily. Waiting a quarter of an hour, during which he continued to improve, I again attempted to draw down some remaining masses. Suddenly a paroxysm of dyspnœa seized him, and, with a few convulsive movements, he fell back dead.

Dissection twenty-four hours after death.

Thorax. Lungs engorged. Cavities of the heart distended by dark fluid blood. The abdominal viscera and the contents of the cranium were natural.

The skull, with the bones of the face, having been removed by a section through the foramen magnum, I was enabled to trace out the parts occupied by the disease. It was found to occupy the nasal passages on either side the cavities of the antrum as well as the sphenoidal and ethmoidal sinuses. These cavities were distended by the growth, but nowhere were the bones either softened or carious. Its appearance was brainlike, and it possessed all the microscopic and physical characters of encephaloid cancer.

The malignant polypus is distinguished from the mucous or benign by the following characters.

The mucous is often attached by a pedicle, and admits of movement with the respiratory act. Its influence in closing the nasal passage is affected in a marked degree by damp weather.

In growing so as to completely fill the nasal passages it will not encroach beyond them; it will not invade adjacent parts; it does not induce the enlargement of the neighbouring glands.

From the fibrous, by the hard resistant character of these formations, and by the circumstance that they invariably spring from the periosteal coverings of the bones, and push before them the mucous lining.

Whilst malignant nasal polypi in their extreme growth penetrate into and distort adjacent cavities and parts, certain polypi, of identical character, having their origin in the maxillary sinus, sometimes escape through the orifice of the sinus, and for the first time become evident as a disease in the nasal fossæ.

The knowledge of these facts will necessitate, in the examination of any case of assumed nasal polypus, a careful inspection of the regions of the antrum and bony palate, the appearances of which may indicate the exact locality in which the disease has commenced.

The following case illustrates the first-mentioned mode of origin and extension.

E. B., *æt.* 50, a widow, came under my notice at the Hospital November 21st, 1862. A strong, well-made woman; had been well up to four months since. She then noticed a tickling sensation in right nostril. A surgeon, whom she consulted, took away a part of a growth he found there, and three weeks afterwards, the space having filled again, a second part was removed. I found the right nostril completely filled with a spongy, livid-looking growth, and the left nearly so. On the right side the bony palate had given way, and the growth formed a protrusion in the mouth covered by thinned mucous membrane.

Externally its advance was marked by a swelling on the facial surface of the antrum by a pushing upwards of the floor of the orbit and by an expansion of the nasal bones. There was thickness of the voice and impeded respiration; scarcely any pain, and no enlarged glands. There was no history of cancer in her family.

I could not recommend any operation, so I lost sight of her.

Moreover, encephaloid cancer, resembling polypus, may appear in the nose by perforating the ethmoidal bone, having had its development within the cranium.

It will be observed that in E. B.'s case the affection in the nose had only been noticed

four months before I saw her, at which time the extensions were of the gravest character, and it is impossible to conceive that mere polypus of the nose could have produced these changes without having attracted attention at a far earlier period.

The extension of the nasal disease to the sinus is comparatively infrequent, its course, as shown in the following case, being inclined rather towards the pharynx and to widening of the nasal bones.

> O. C., *æt.* 24, married, a puddler by occupation, a miserably cachectic-looking man, was admitted under my care in the Hospital November 6th, 1863, on account of a growth in the nose. He tells me that five months ago he noticed that the nasal passages were obstructed, and that he had lost the sense of smell. Soon after this he had repeated bleedings from the back of the mouth, and a frequent thin, straw-coloured, sometimes bloody, discharge. The disease progressed rapidly. He began to see things double, and squinted with the right eye.
>
> He had always enjoyed good health until the time above-mentioned, and his family history was good.
>
> On examination I found a small spongy growth filling the nasal passages. It was apparent anteriorly, but its chief advance was behind where it blocked the posterior nares and bulged the soft palate downwards. Externally the nasal bones were protruded outwards, and widely separated from each other. The glands over the parotid region were enlarged on both sides of the neck.
>
> He returned home without operative interference.

In these cases the neighbouring glands very rapidly take on a malignant action, and shut out the chance of any surgical interference. It was so in the case below.

> J. C., *æt.* 55, a labourer of healthy appearance, from Shipston-on-Stour, was admitted under my care in the Hospital December 22nd, 1863, on account of what he thought was polypus of the nose. Ten weeks since he became sensible of a growth in the left nostril. It was painless, and beyond the presence of a thin discharge and a diminished sense of smell he had no other inconvenience. He says that his mother had nasal polypus, which twice recurred after removal. There was no reappearance afterwards, and she died of consumption at the end of fourteen years from the date of the last extraction.
>
> On examination the nasal bone of the left side, and the nasal process of the superior maxillary bone, are seen to be considerably bulged outwards. Within the left nasal cavity is apparent a spongy, vascular growth. Air yet passes, but only with great effort. The right passage is free. There is no deformity within the mouth. In the centre of the left cheek is what appears to be an enlarged and somewhat hardened gland of the size of a pigeon's egg, and beneath the jaw the submaxillary and other glands are also enlarged.
>
> In the presence of the glandular complication I did not advise operative interference. He therefore left the Hospital, and I did not see him again.

Treatment.—Tearing malignant polypi from their attachments by forceps, destroying them by actual cauteries, or partially excising them, will prove of little beyond very temporary benefit.

If the attention of the surgeon has been early called to a case of this kind, and the adjoining glands are unaffected, the nose should be freely laid open, so that the parts involved can be distinctly seen and completely excised.

As a palliative proceeding, the attempt which I made in the case of J. B. may sometimes be successful, but the danger of suffocation will render it always peculiarly hazardous.

Where the pressure on the pharynx is very marked in the early stages, and before exhaustion has set in, the operation of tracheotomy would give a better prospect of prolonging life, and would diminish the dangers that might attend any subsequent efforts made to clear away the disease from the posterior nares.

CHAPTER VIII.

ENCEPHALOID TUMOURS OF THE UPPER JAW.

ENCEPHALOID cancer of the superior maxillary bone is of very frequent occurrence, the comparative order placing it considerably above the localities of the femur and tibia.

To determine the parts of the sinus from which the tumour originates will almost always be impossible, and the surgeon will rather content himself with forming a judgment on the disease as it involves any part of the bone that may require excision, than endeavour to refine on limits of origin, uncertain in themselves, and which exercise little influence on the treatment.

This disease presents the following symptoms:

The patient is sensible of a dull or sometimes lancinating, aching pain in the jaw, frequently associated with decay in the teeth, and with a spongy, bleeding state of the gums.

A tumour may present itself on the alveolar margin in the places of the fallen teeth, or it may appear in the palatine arch, in the nasal passages, on the cheek below the orbit, or in the zygomatic fossæ.

Externally, the veins become apparent, distended, and tortuous, and the lymphatic glands enlarge. As the disease advances the sense of smell becomes affected, and if it has pushed its way to the orbit, vision may be impaired, whilst copious and fœtid discharges frequently interfere with the function of taste.

The circumstances of origin and progress to which I have referred are exhibited in the two next cases.

W. T., *æt.* 60, married, a dark complexioned, unhealthy-looking man, was admitted under my care in the Hospital on February 10th, 1860.

History.—Twelve months ago he suffered from a sore mouth, mainly produced by decaying teeth. The remains of these from the position of the incisors, were entirely removed along the left upper alveolar region. Profuse hæmorrhage succeeded this measure, and in a little while the gums became spongy and enlarged. The bleeding continued at all times in a degree more or less excessive, and was not restrained by numerous measures applied for its relief. Has had good health in life, and there is no history of cancer in his family.

Present condition.—The patient is exceedingly weak, and has an exsanguine appearance. Along the left upper alveolar region is a vascular, encephaloid mass, occupying the entire gum, from the position of the first left incisor to the last molar tooth. It stretches partly over the adjacent palate, and occupies and pushes out the external wall of the antrum. There are no glands enlarged.

February 22nd.—I proceeded to extirpate the parts affected, having previously administered chloroform. A single incision was made from the inner margin of the eye downwards through the lip, and the flap thus made dissected clearly off the maxillary bone, and held forcibly back by an assistant. The horizontal palate was then cut through, followed by the nasal process of the maxillary. A saw carried obliquely downwards below the orbital margin and across the malar bone enabled me to tear and shake out the remaining connections of the bones, and the operation was concluded with the ligature of only a single vessel in the lip.

The disease, on examination, proved to be encephaloid cancer, having its origin in the gum around the alveolar sockets. From these points it had extended, absorbing the adjacent bones, and penetrating into the cavity of the antrum. It had not reached the floor of the orbit.

The patient made a good recovery, and left the Hospital, in the appearance of health, at the end of March.

July 14th.—He came as an out-patient. His health and appearance were satisfactory, but the disease had presented itself during the past week at the margins of the divided palate.

This patient died in the first week in December, nine months after the operation. Mr. Houghton, of Dudley, under whose notice he fell at last, writes: "The disease returned in the opposite maxilla, and a large fungus protruded into the mouth and sloughed off several times, and was reproduced. A large tumour, evidently cancerous, sprang from the temporal bone occupying the fossa on the side subjected to operation. There were no symptoms of chest disease."

R. F., *æt.* 23, single, a gunstocker by trade, a small, sharp-looking man, of dusky complexion, was admitted under my care in the Hospital, August 14th, 1860, on account of a swelling of the upper jaw on the right side.

History.—Ten months since, whilst suffering from syphilis, perceived a hard growth beneath the right eye. It grew slowly, and he did not interfere with it otherwise than by leeches and fomentations. The sight of the eye gradually became weakened, and he lost a good deal of blood from the nostrils. He was salivated, but the tumour grew and gave him at times a considerable pain. There is no history of cancer in his family.

Present condition.—The patient has a markedly syphilitic aspect, and about the shoulders are many copper-coloured patches. The tumour is prominent on the cheek, pressing up the lower eyelid so as to interfere with the sight of the eye. It presses the inner wall of the antrum inwards so as to close the nasal passage, but not in any way affecting the septum. Backwards there is no appearance of its affecting the mouth or posterior nares. The integuments covering it on the cheek are discoloured and thinned, but otherwise not affected. There are no glands enlarged.

August 23rd.—I excised the entire right upper maxilla under chloroform. Incisions were made from the root of the nose and zygoma to the centre of lip and angle of mouth. The nasal process of the superior maxillary was cut across, as were also the bony palate and malar bone. The floor of the orbit was separated, and the bone with the tumour was torn from its posterior attachments. There was but little bleeding, and the patient made a good recovery.

The tumour proved to be of encephaloid character, and had its origin from within the cavity of the antrum, whence it had spread in all directions, absorbing the bone, however, mainly on the cheek, where its advance was most marked.

October 22nd.—Attended to show himself as an out-patient. There is no deformity of face, only the lines of the incisions are visible. There is yet the same dusky syphilitic aspect about him. Ordered that twenty drops of the syrup of the iodide of iron should be taken three times daily.

January 7th, 1861.—Came to me again. Was strong and well.

April 23rd, 1864.—I received a letter asking me to visit him in the town. I did so, and found him in extreme poverty and disease. He tells me that two years since the tumour began to grow again, and has made way sometimes slowly, sometimes rapidly, to the present time. On examination within the mouth, the seat of operation is occupied by a mass of sloughy encephaloid cancer. Without, the side of the face and the ala of the nose are enormously distended by the growth, and the eye is pushed on one side. He complains of little pain, and more of a sense of intense debility.

He lingered on for nearly a year, dying of exhaustion, March 2nd, 1865.

Dissection thirteen hours, p.m. Body profoundly emaciated. Face distorted by the encephaloid growth. This occupied the seat of operation, the nasal cavities, and partly the opposite palate. The roof of the right orbit beyond the point of removal was absorbed, and a cancerous mass was found pushing up the internal pericranium and pressing on the base of the brain.

The brain itself was natural.

Thorax. The lungs were broken up by softened masses of encephaloid deposit. Some of the deposits were very large, measuring two to three inches in diameter, whilst others were not larger than a marble.

Encephaloid tumours of the upper jaw may be mistaken for (1) chronic collections of fluid of any kind in the sinus, (2) polypus, (3) fibrous and osseous tumours.

A collection of mucus, confined for a length of time within the limits of the cavity, may, and in many cases actually does, assume in its extension many of the characters of malignant disease. The most yielding portions of the walls of the sinus give way and a tumour appears beneath the upper lip, in the situation of the canine fossa; or the wall of the palate, or the nose, or the floor of the orbit become bulged. The tumour, moreover, is very firm, and, from its state of tension, gives no evidence of fluctuation.

Under these circumstances the slowness of enlargement, together with the complete absence of pain, the non-existence of enlarged veins or glands, and, lastly, the test of puncture, will serve to guide to a correct opinion.

In the case of abscess in the sinus, the intense pain more or less apparent throughout, and the escape of purulent fluid on an exploratory puncture being made, will at once determine the nature of the affection.

The extension of polypi from the nose, or their development primarily in the sinus, may give rise to fœtid discharges and to hæmorrhage. In either case the extension and rapid growth of the malady will be the surest means of forming a judgment.

As the fibrous and osseous tumours require for their relief the same measure which is alone applicable to the cancerous, and inasmuch as the former cannot with any certainty be distinguished from the latter before operation, I shall illustrate anything further I may desire to add on the subject of their diagnosis by a reference further on to examples of these forms of growth, and at once proceed to consider the subject of treatment.

Complete extirpation of the bones with which the cancer is connected is, in every case, the only remedy applicable in the upper maxilla.

This proceeding cannot be regarded as promising other than palliative relief, but the difficulties of diagnosis in the early stages of the tumours found in this region, and the fact that a similarity of treatment is necessary for all, will lead the surgeon in a great number of instances to recommend the patient to submit to the chances of an operation.

The earlier, however, that this is done the greater will be the chance of subsequent immunity from return. So long as the disease is mainly confined to the cavity of the antrum it can be completely extirpated by the surgeon; but where the neighbouring glands are enlarged—where extensions have spread to the pterygoid processes or the ethmoidal cells, and their entire removal becomes impossible by the knife and unpromising by any other means, operative interference ought not to be recommended.

Having regard, however, to the marvellous rapidity with which patients almost always recover from the most serious operations on the face, and especially to the fact that death rarely ever immediately follows as a result of this operation, there are few if any cases, if the patient desires it, in which the surgeon may not undertake it with the view of prolonging life. It may be thus performed:

The patient reclining in a chair, chloroform should be administered to the extent of insensibility, its use throughout the subsequent stages of the operation must then be abandoned; the amount inhaled will, however, suffice to render the remaining parts of the proceeding almost painless to the patient.

Any teeth in the line of the incision through the jaw having been extracted, the patient's head should now be supported against the breast of an assistant. With a stout scalpel an incision should be made from the root of the zygoma to the angle of the lips, dividing at one sweep all parts to the bone. The single flap thus formed should be dissected upwards, and turned fairly and completely over the forehead, care being taken that the attachments of the ala of the nose are freely separated, and that the parts within the orbit are dissected from the floor and held out of harm's way by the handle of a scalpel or by a curved spatula.

The bones superiorly may now be divided by means of cutting forceps. First, the external orbital process where it joins the malar bone, then the zygomatic arch and the nasal process of the superior maxillary; next, carry the knife through the soft parts covering the junction of the maxillary bones in front beneath the alæ of the nose, and complete their division by running it along the palate. With a small saw divide or notch the two maxillæ in this situation, and complete their separation by passing the blades of the cutting forceps into the mouth and nose, so as to run along the palatal arch. Any remaining bony connexions on the floor of the orbit, or with the pterygoid process, having been cut by the forceps, a few touches with a scalpel will sever the velum of the palate and any other soft parts that yet retain their connexions.

In case of the disease requiring greater freedom for the flap, two incisions may be preferred; the outer one starting from the root of the zygoma and terminating at the angle of the

lips, and the inner one commencing just blow the internal orbital process and carried downwards around the ala of the nose and through the centre of the lip.

Far less disfigurement attends the first-described method, and it affords as much facility in the subsequent steps of the operation if free dissection is practised.

Where the floor of the orbit and the malar bone are not involved, the saw should be carried horizontally below the margin of the orbit, and a sufficient groove having been made, the cutting forceps will readily complete the severance in this situation, and enable the operator in many instances to leave these parts.

In all these operations it is well to tear away the tumour and its attachments at the final stage, thus avoiding the use of the knife in the situation most likely to give rise to hæmorrhage.

The flaps should not be fastened together until some hours after the operation, when the chief risk of hæmorrhage has passed away. Any bleeding vessels that cannot be secured by ligatures or other ordinary means should have the actual cautery applied to their mouths.

The risk of dangerous hæmorrhage in this operation seems to be much less serious than would at first sight appear. I have myself only once witnessed its occurrence amongst the very many cases I have watched.

I have no doubt that this immunity is due to the great tearing and pulling at the last stages of the operation, in place of the use of the knife.

The extension of the disease backwards towards the pterygoid processes, the existence of which can hardly be ascertained before the removal of the disease is being effected, will certainly endanger the trunk of the internal maxillary artery, even when the utmost caution is observed during the operation, as the following case bears witness.

S. C., *æt.* 38, a small, spare-made man, was admitted into the Hospital under the care of my late colleague Mr. Ampilett, March 3rd, 1848, on account of an extensive growth occupying the situation of the superior maxillary bone of the left side.

History.—He is by occupation a sawyer, married, the father of three children, and has always enjoyed good health. His family are healthy. Four years ago he caught cold and was ill for several weeks; he also, at this time, had a fall, by which the outside of his cheek was severely bruised; on his recovery he was greatly reduced in strength and very low. Fifteen months ago, by chance, happening to place his finger on the outer gum of the left upper jaw he felt a hard tumour of the size of a hazel nut. He took no further notice of this for a period of three months, when he found it had increased to the size of a walnut. He now examined it more carefully—punctured it with a stocking needle, and observed that no fluid escaped and that he experienced no sensation of pain. Previously to the time of discovering the swelling he had suffered, from time to time, with severe aching of the double teeth on the affected side.

Subsequently the disease rapidly extended and began to press the cheek slightly upwards. It is now nine months since he placed himself under the care of a surgeon, who repeatedly applied caustic and made free use of the lancet. After this he suffered pain, and the disease made progress. Since this time he has applied blisters to the cheek, without relief, however, to a dead aching pain almost constantly present. During the last two months the disease has grown faster, pushing up his lower eyelid, and rendering the passage of air difficult down the left nostril. There has been no hæmorrhage.

Present condition.—General health good. The left malar region appears larger than the right. The surface is reddened and swollen, and the inferior eyelid is raised considerably towards the superior so as to impede the sight. A small ulcerated opening discharges pus close to the inner angle of the orbit. On examination the disease is found to occupy the superior maxilla of the left side. In the gum one bicuspid, the canine, and one incisor yet remain. The growth is irregular. Backwards it can be felt at the extreme end of the alveolar ridge. Outwards it is in close contact with the cheek, investing from below upwards the exterior aspect of the bone. Inwards it occupies the palatal arch to within a quarter of an inch of the central raphe. To the touch it is firm and unyielding. Its surface has, in parts, the appearance of being covered by healthy mucous membrane, whilst in others it is sloughy and ulcerated. The gums are generally rather vascular and spongy. Externally it is felt through the reddened integuments of the cheek extending upwards to the inner angle of the eye, whilst the situation of recent increase is very evident towards the malar bone. Traced along the floor of the orbit the bone can be felt to be pushed up by the growth below, and the left nasal bone is seen to be somewhat encroached on. Below, the swelling and discolouration of the cheek terminate about three quarters of an inch from the angle of the mouth.

March 15th. The patient was made the subject of the following operation. A first incision was made commencing at the inner angle of the eye, passing downward by the left ala of the nose through the upper lip; a second from the malar eminence to the angle of the mouth. In these incisions the

coronary and facial arteries were divided and immediately tied. The flap was then raised and held out of the way. Next, the attachments of the soft parts to the palate were severed, and the section through the nasal aperture and plate of the palate effected by the cutting forceps. By means of a small HEY's saw, the bone beneath the orbital cavity was carefully divided, and the malar articulation cut through by the forceps. Considerable difficulty was experienced in getting with the forceps well behind the extent of the disease, and when this was at length effected, the whole mass being loosened, turned out from its attachment to the floor of the orbit above, perfectly rounded, free, and distinct. It was however seen that a considerable portion attached to the pterygoid process had been left behind. This was subsequently removed. In this proceeding there was great hæmorrhage, and what appeared to be the mouth of the internal maxillary artery was ligatured. Cold and a sponge restrained the smaller vessels. After the integuments had been placed in apposition there was again hæmorrhage, and it became necessary to leave a sponge in the hollow of the wound.

On the second day after the operation the sponge was removed, and the patient went on favourably until the 7th. At one A.M. I, being house surgeon at that time, was called to him by the nurse, and found that he was bleeding from the wound, he had lost a pint of arterial blood before I reached him, and as much more before I could effectually arrest it by replacing the sponge and keeping up pressure on it.

Eight hours afterwards there was recurrence of the bleeding, which was again arrested by pressure. In another eight hours a more uncontrollable seizure occurred, which was arrested by pressure on the left carotid. The left common carotid artery was now tied by one of Mr. AMPHLETT's colleagues, who happened to be in the Hospital.

There was no blood lost during the operation, and subsequently there was no recurrence of bleeding.

The patient died the following day at noon.

Dissection twenty-four hours after death. Body pale, but not emaciated. The several contents of the thorax and abdomen were perfectly healthy. In the cavity of the right pleura were a few ounces of very pale serum, and the same was observable in the pericardium. The Brain: preternatural adherence of the dura mater was manifest to the upper central portion of the cerebrum. The vessels of the pia mater were engorged, whilst the membrane itself was milky and opaque. Each ventricle contained small quantities of very pale serum.

On examining the region of the left maxilla superior, the disease appeared to have been wholly removed. The floor of the orbit that had been left was extremely thin, and broke down readily on pressing the finger against it. The nasal bones and those forming its cavities were seen to be free from the encroachments of the growth. A gland situated over the parotid was enlarged, and on being cut through presented a fungoid aspect. A still larger gland, situated over the region of the submaxillary, though greatly increased in size, was yet healthy.

The character of the disease removed presented the well-marked characters of encephaloid cancer.

In the earlier stages of fibrous, fibro-cartilaginous, and osseous tumours of the upper maxilla there will be some difficulty in distinguishing them from malignant growths, the length of time they occupy in attaining very moderate dimensions being, perhaps, the most certain sign of their nature.

Later, when their magnitude has become considerable, this difficulty exists no longer.

The skin covering these growths, though often discoloured, does not become adherent to them: it is stretched and thinned as well as the adjacent mucous membrane and surrounding bone, whilst the veins alone, from the same cause, in both classes of disease, that is to say from mechanical pressure, partake of a corresponding prominence and enlargement.

A brawny and bony feel further characterizes these tumours; and, lastly, in the face of very long persistence and excessive growth, the neighbouring glands are not affected.

The following case is a good illustration of the least frequent of these forms of tumour.

W. B., *æt.* 26, a pale, unhealthy-looking man, by occupation a clerk, and unmarried, was sent to me by Mr. R. L. FREER, of Stourbridge, and admitted under my care in the Hospital May 30th, 1864, on account of a solid tumour occupying the situation of the right upper jaw.

History.—Five years since he observed a thickening of the parts around the remains of the first molar tooth on the upper jaw of the right side. He had always had bad teeth, and had suffered from toothache in an extreme degree. The thickening very slowly increased, and as it gave him no pain, he did not take much notice of it until an enlargement of the cheek externally excited his attention. His family history is satisfactory.

Present condition.—The outside of the right cheek presents an elevation of an oval shape situated beneath the margin of the orbit, and extending backwards to the inferior edge of the malar bone. The integument, beyond a little reddening, is unaffected. Internally, the alveolar margin, from the position of the first molar tooth backwards to the situation of the last molar, is pushed downwards into the mouth; whilst forwards, to the position of the first bicuspid, a less prominent protrusion of the part is observable. The outer wall of the antrum and the horizontal portion of the palate are expanded over what appears to be a solid tumour feeling like bone, unyielding to the touch, free from pain, and with

the mucous covering entirely free from ulceration. The nasal cavity is unaffected, and there are no glands whatever enlarged in the vicinity.

June 1st. Having given chloroform to the extent of complete insensibility and forbidden its further use, I drew the incisors on the right side of median line, and cut through, by a single sweep of the knife, the soft parts from the inner angle of the eye downwards by the side of the nose through the upper lip. This single incision freely dissected upwards, and held out of reach, gave sufficient room to apply the saw and forceps to the bone. First, the alveolar margin was cut through into the nasal cavity; next, the nasal process of the maxillary; then the bone close below the margin of the orbit. The soft parts in the mouth were next divided, and the mass pulled forcibly down, when it was seen to turn out easily from its contact with the floor of the orbit, requiring, however, free use of the cutting forceps to complete its separation from the posterior wall of the antrum, to which part it was solidly united by bone.

The hæmorrhage, during the operation, was at times of a very active character; but no vessels, except those of the integuments, required ligature.

The parts were closed after five or six hours, and the patient experienced but little shock.

On examination the tumour was found to consist of pure bone—hard and heavy, not altogether solid—but with finely-arranged cancelli throughout. In places it was attached and inseparable from the bones of the part; as, for instance, at the alveolar margin, where it commenced, and at the posterior wall of the antrum, but above and internally it was separable from the bony walls of the antrum, into which it grew.

His recovery was uninterrupted, and he left the Hospital within a month after the operation.

I have seen this patient very recently. An excellently contrived apparatus, made by Mr. S. A. Parker, of this town, fills in the place of the jaw and its teeth. There is wonderfully little disfigurement, and the health is much better than in former years.

The symptoms against malignancy in the case of W. B. were mainly the length of time the tumour occupied in growing, and the absence of enlarged glands. Except where this form of disease has been permitted to become of long standing, some portion of the growth is usually capable of enucleation from its bony bed, thus enabling the surgeon to leave behind the parts that have been simply pressed out of place or thinned, as was the case here with the floor of the orbit; but wherever there is integral connexion of the bone-tumour with the surrounding bones, these latter must be effectually excised, or reproduction of the bone-tumour will result.

CHAPTER IX.

ENCEPHALOID TUMOURS OF THE LOWER JAW.

IN the lower maxilla encephaloid cancer does not present the same difficulties of diagnosis which are met with in the upper.

It ordinarily arises from the decaying socket of one of the teeth, very frequently from the body of the jaw itself; and sometimes it commences in the soft parts, and extends thence to the bone.

When it commences in the socket of a decayed tooth it presents itself as a soft, spongy, bleeding fungus. It is the seat of pains of varying intensity and character. At first its growth is slow, but afterwards it rapidly involves surrounding parts—the adjacent glands enlarge and the tumour spreading, ulceration sets in and destroys the life of the patient by repeated hæmorrhages and discharges.

In the body of the bone it appears as a tumour between the plates, enlarging the part unevenly, expanding the walls and sometimes absorbing them, and attaining, in many instances, a considerable size before breaking outwardly by ulceration. Occasionally these expansions of the walls contain within them cysts filled with serous or glairy fluid.

Less frequently the gum and periosteum give rise to small spongy growths, which at first resemble epulis, but which involve the bone and assume all the characters of encephaloid cancer in their subsequent career.

The peculiarity of origin, by insertion between the compact layers of the bone, is well marked in the following case of A. D., and if the woodcut of the parts removed is observed it will be evident how futile any operative interference would have been here without taking away the entire thickness of the bone. *Fig.* 6.

A. D., *æt.* 28, a fresh-looking married woman, from Great Bridge, was admitted under my care in the General Hospital January 23rd, 1860.

Twelve months back the last molar tooth on the left side of the lower jaw fell into a carious state and came easily away. Soon after this she noticed a small spongy growth in its place, which increased gradually until she came under my notice. She has always enjoyed good health, and her family history is satisfactory.

On examination a bright red granular mass is seen, growing inwards and backwards from the interval between the first molar tooth and the ramus of the bone. Internally it stretches downwards within a short distance of the inferior margin of the maxilla; but externally its influence is only manifested by a marked increase in the thickness of the body of the bone. It is highly vascular, and, at times, somewhat painful. There are no glands enlarged in the neighbourhood.

February 8th.—I excised the portion of the lower jaw involved in the disease, sawing through the bone in front, at the situation of left canine tooth, and behind at the commencement of the ramus.

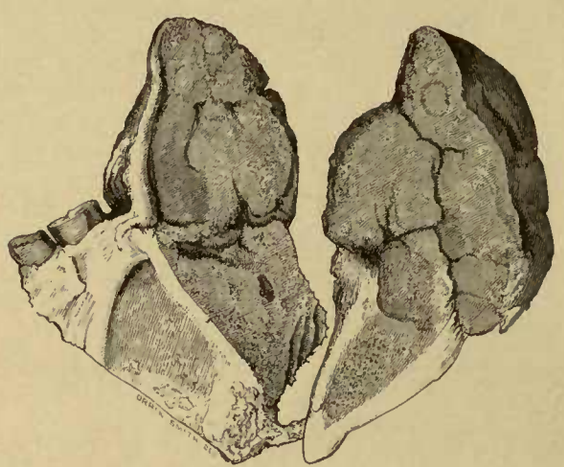
A section of the disease exhibited its lodgment between the compact plates of the bone, which were pushed asunder and thickened. On the alveolar surface, where its larger spongy formation was most apparent, it was seen to be blended with the periosteum and mucous membrane.

March 23rd.—The patient left the Hospital in good health with the wound completely healed.

May 27th.—She presented herself as an out-patient. At the sawn ramus a small spongy mass of granulations is apparent. This was not interfered with in any way.

February, 1861.—During the nine months that have elapsed since her last visit to me only a very moderate increase has taken place in the renewed growth. I this day carefully dissected it away from the bone, and applied nitric acid to the bleeding surface. Her general health was highly satisfactory, and she declined to have the remainder of the bone extirpated.

Fig. 6.



November 12th, 1862.—A. D. came under my care again. Springing from the same spot was a fresh growth having a fungous appearance. By means of a pair of cutting forceps I succeeded in dividing the portion of bone to which it was attached. The fungus measured two inches in length by three quarters of an inch in breadth. Her general health was good, and there were no enlarged glands.

May 30th, 1864.—I hear from A. D. that she is pretty well in health; she says, however, "My face will soon have to come under your hands again."

May 25th, 1866.—A. D. writes—"My health is pretty well at this time. The affected part of my jaw does not seem to get any larger. It does not hurt me at all."

Of the early origin of this disease, by the expanded bone containing cysts passing subsequently into encephaloid degeneration, the annexed case affords an example.

A. W., *æt.* 19, a healthy-looking girl, unmarried, and following the employment of a draper's assistant, was admitted under my care in the Hospital August 11, 1859, having a swelling on the left side of the lower jaw.

History.—When twelve years old she fell and sustained a severe bruise of the outside of the lower jaw in addition to injuring the left second molar tooth. A year and a half since she suffered from toothache: the remains of the second molar came away, and in its place appeared a small spongy growth. The gum enlarged and the face became swollen, and very gradually the jaw itself increased in size. After the bone had been enlarging for about nine months the swelling was freely opened on the alveolar surface and a considerable quantity of clear glairy fluid let out. A probe passed within entered a long bony cyst, the walls of which were formed by the expanded compact tissue of the inferior maxilla. For some time after this the cyst was injected with a solution of iodine without any effect in changing the progress of the disease. She has had no pain except from the toothache referred to, and her family history is satisfactory.

Present condition.—The left side of the maxilla, from the canine tooth to within a small space of the angle, is expanded so as to form a firm bony tumour. Laterally its walls are covered by healthy soft parts pressed outwards by the growth, whilst on the alveolar surface a firm, non-vascular, fungous-like substance, covered over in parts by altered mucous membrane, fills in the centre space. The first molar and bicuspids remain loose and are pushed upwards. There are no glands enlarged.

October 8th.—Under chloroform I proceeded to extirpate the portion of bone implicated. An incision was made, commencing on a level with the lobe of the ear and terminating at the mesial line of the chin. The soft parts being cleared away the bone was sawn and cut, in front, at the place of the second incisor tooth, and behind, just above the angle of the jaw, at the situation of the dental canal. The single incision thus made sufficed to enable me effectually to remove the disease, and by keeping its line well under the lower margin of the bone to escape the chance of subsequent disfigurement. The bleeding was inconsiderable.

On examining the tumour its floor and sides were seen to be formed by the expanded bone; these latter, as they approached the alveolar surface, curved inwards towards each other so as to narrow the space out of which the soft portion of the disease had sprung. This filled in the cavity and presented the ordinary appearances of encephaloid cancer. The bone was nowhere absorbed.

The wound rapidly healed and the patient recovered strength.

November 18th.—I noticed a small mass of firm red granulations, non-vascular, occupying the position of the sawn extremity of the ramus. I destroyed them with pure nitric acid.

December 15th.—These granulations reappeared to the extent of the size of a kidney-bean. I now cut them off with the scalpel and again applied the nitric acid.

March 25th, 1860.—The patient well. No sign of any return of the disease.

June 8th, 1866.—I saw this patient to-day for the first time since the last note. She looked pale and was thin, and there was an evident tumour at the seat of operation. On looking inside the mouth I found the space between the sawn bones filled in by a firm mass of encephaloid cancer. It was non-vascular and painless, and had been growing slowly for about six months. Until very recently her general health had been good, and she had not ceased, since leaving the Hospital, to follow her employment as a shopwoman. The submaxillary glands on both sides were enlarged.

Treatment.—Excision of the entire portion of the bone with which the tumour is connected, and very frequently of the corresponding articulation, is the only remedy applicable to cancer in the lower jaw.

To secure a lengthened immunity from return of the disease the removal must be free and complete, and in those cases where it is situated near the angle so as to encroach on the ramus disarticulation should in all cases be performed.

In the cases of excisions of portions of the body that I have watched in their subsequent conditions the return of the disease has invariably occurred in that portion of the divided jaw nearest to the articulation. I have myself not seen it return, to commence with, in one instance in that portion nearest to the symphysis.

In regard to this fact the cases of A. D. and A. W. strongly impress me, and I regret now that I did not disarticulate in both instances at the first operation.

The history of these patients subsequent to the operations strengthens the belief that cancer is less rapid in its progress in the lower jaw than it is in the upper—that there is a less speedy tendency to softening and contamination.

Hence the more completely the local manifestation of the cancer is removed in this situation the greater probability will there be of a curative action resulting.

In dealing with fibrous tumours and with certain forms of epulis it may be often both practicable and prudent to leave the lower margin of the bone, and thus prevent very material deformity; but this proceeding can only be advisable in the simple growths, never in any case where there is the least suspicion that the rim of the bone left behind is not completely sound, or that the probability of future malignant action in the part is not in the highest degree improbable.

Excision of any portion or the whole of the lower jaw may be carried into effect without division of the lip or angle of the mouth. By this means the escape from the deformity of visible scars will be almost complete.

Should the tumour occupy the central or horizontal portions of the jaw the length of the incision must be calculated to such an extent as to admit of the flap being readily held out of the way of the saw. Its direction must be under the lower edge of the bone. The surgeon having satisfied himself on this point, and having previously extracted the teeth where the division is to be effected he dissects off the soft parts externally. An assistant holds these up by a curved spatula slipped beneath them at either extremity, and the operator at once applies the saw, effectually passing through the part with this instrument or completing the division with the cutting forceps. Then the bone with its tumour can be seized by the fingers, and, being pulled forcibly outwards, the internal soft parts on the stretch are carefully severed by the scalpel close to the bone, and the removal completed.

As they are divided, any bleeding vessels should be at once tied, and especially the facial artery, which often embarrasses the operation by bleeding profusely.

Where the symphysis of the jaw is involved in the disease so that the muscles attached to it are necessarily divided, the precaution of passing a ligature through the tongue to prevent the possibility of its falling back and inducing suffocation, should never be omitted. This provision is only of a temporary nature, and may be safely dispensed with on the re-adjustment of parts and completion of the dressings.

In case the disease involves the portion of the body and the ramus near the angle, then it will be necessary to extend the semilunar incision, already described, in a vertical direction behind the ramus, carrying it, if necessary, to a point immediately behind the articulation of the lower jaw, so as to effect the removal at this situation, if desired. The soft parts contained in this flap having been dissected off, are held away by an assistant, and the saw is applied in front of the tumour. The surgeon, now grasping the divided bone, cautiously dissects around the tumour and separates any other attachments as far as the angle of the jaw, and may complete the operation according to the necessities of the case by sawing through the ramus at its junction with or immediately above the angle; but in case disarticulation is required, a probe-pointed bistoury should be passed beneath the zygoma and behind the coronoid process, so as to divide the attachment of the temporal muscle, the bone at the same time being kept well depressed and twisted somewhat outward. The articulation is next attacked, being opened in front, the knife being kept close to the neck, and the disarticulation is then completed by the division of the pterygoid muscles and the articular ligaments. In all this the greatest care must be taken to avoid wounding the internal maxillary artery, and the only way to succeed is to pull the part strongly outwards, to use a probe-pointed bistoury, and to keep close on the bone.

Should the case require the removal of the whole of the lower jaw, the incision, starting on one side from just behind the articulation, must extend to a corresponding point on the other. The bone, having been cleared of soft parts, should now, if the nature of the disease permits, be cut through at the symphysis, and either half removed in the manner and with the precautions above described.

In case the internal maxillary artery has been wounded it must be tied at once, and often much subsequent anxiety and danger will be avoided if the common trunk of the external carotid itself is ligatured just before its terminal branches, the temporal and internal maxillary, escape from beneath the posterior belly of the digastric muscle. By this means I can conceive many of the difficulties that attend the performance of this most formidable operation would be lessened, if not altogether removed.

All other bleeding having been controlled either by ligature or, if necessary, by the application of the actual cautery, the wound may be dressed at the expiration of some five or six hours.

A few silver ligatures suffice to bring the soft parts accurately together, an opening being left for the escape of saliva and discharge of mucus and serum. Within the mouth it will be advisable to place a pad of lint in immediate contact with the cavity left by the operation.

For many days following the patient should take nourishment only through a quill, and great care should be taken to effectually cleanse the wounds inside the mouth, by the frequent use of refreshing gargles, from the very fœtid discharges that are apt to accumulate.

Within a short time after the wounds are healed an apparatus, to prevent that sinking-in which leads to deformity, should be constructed, and worn in lieu of the portions of jawbone removed; and in some instances where, as in the cases of female patients, it is desirable to reduce the subsequent appearances to as small a scale as possible, an apparatus can be fitted, previous to the operation, by which the upper and lower teeth can be secured within a very few hours after its completion, whereby much additional quietude is obtained during the healing process and the natural shapeliness of the divided parts maintained. It is, however, marvellous how little real disfigurements attend these operations on the jaws.

The characters of cancerous growths given at the commencement of this chapter will, in almost all instances, sufficiently mark the existence of the disease and serve to distinguish it from

all other tumours in this situation, but as the treatment applicable to the malignant is not altogether identical with that to be bestowed on the simpler forms of growth affecting this part, of which the fibrous may be taken as the general example, it is necessary to examine the features of the latter in order to recognize them with certainty.

The following characters mark the fibrous tumours of the lower jaw, and distinguish them from encephaloid.

The fibrous tumour usually occurs in young and robust subjects. Enlarging so as to expand the compact tissue of the bone, the surrounding nerves for the most part escape pressure; hence, pain at any stage is infrequent.

It grows slowly, does not contaminate the adjacent glands or enlarge the veins that traverse its surface. In shape it is rounded and regular, very commonly ovoid, and it may attain great dimensions without manifesting any disposition to take on ulcerative action or to involve surrounding parts beyond pushing them out of place and producing inconvenience.

As it constantly takes its origin in the very centre of the bone, the thin osseous shell which covers it, and from which it is often separable when it has grown, frequently admits of easy puncture when the exact nature of the tumour can be determined.

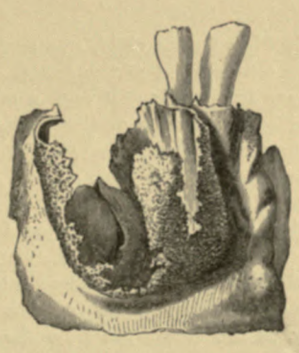
The following case exhibits the mode of growth I have mentioned, and the woodcut displays the very delicate expansion to which the enclosing bone is reduced. *Fig.* 7.

A. E., *æt.* 12, a strong, healthy boy, by occupation a gas tube maker, was admitted into the Hospital January 26th, 1855, having a tumour growing in the lower jaw.

History.—Three years since, whilst eating, a tooth broke and gave rise to pain, and after this there appeared at the spot the tumour. It was slow in growth and painless. Twelve months ago it was punctured and caustic was applied without benefit.

Present condition.—Between the central incisors and first molar teeth, on right side, is evident a firm growth of the size of a pigeon's egg. It projects above the wall of the gum by a rounded smooth surface, covered by a white dense membrane. It extends below, within a quarter of an inch of the lower margin of the bone, and can be felt both on the inside and outside of the bone, as if growing from between its walls. The adjacent glands are unaffected.

Fig. 7.



February 7th. Under chloroform: the soft parts beneath the jaw having been divided and held out of the way the bone was grooved by a saw, beyond the limits of the disease on either side, and the section completed by means of the cutting pliers. The amount of bone removed was an inch and a half—from a quarter of an inch beyond the symphysis on the left to the situation of the molar prominence on the right side.

Upon section the tumour presented the ordinary uniform white structure, with intersecting bands, characteristic of the fibrous outgrowth. It grew from within the walls of the bone; arising about a quarter of an inch from the inferior margin, thence extending upwards, expanding them and thinning their substance until the bony tissue was lost in the dense periosteum covering the upper free surface. By separating carefully the tumour from the expanded wall of the bone I was able to enucleate it below, but above it was inseparably connected with the periosteum.

The patient was discharged well March 2nd.

The mode of origin of this form of cancer in the lower jaw would appear to be particularly determined by the existence of some carious tooth, usually a double one and most frequently

belonging to the molar set. In the case of H. H. this was so; and the fact that portions of the alveolar socket were subsequently thrown off may offer some explanation of the disease being mistaken for necrosis—the denuded condition of the bone in this malady, and after a time the continued absence of affection of the adjacent glands or of the general health, being conditions sufficient to establish a correct opinion.

H. H., *æt.* 47, a worn-looking man, a blacksmith by trade, and married, was admitted under my care in the Hospital March 11th, 1859.

History.—Nine months since a double tooth on the left side of the lower jaw required removal. With the tooth there came away some portions of the alveolar socket, and a bloody discharge continued. After a little time he noticed a hard swelling of the outside of the jaw itself, situated just below the angle of the mouth. At this period the disease was deemed to be necrosis, and no suspicion was entertained relative to cancer. The growth, however, became painful and gradually involved other parts of the bone. His health up to this time had been good, and there was no history of cancer in his family.

Present condition.—Externally there is great enlargement of the left half of the lower jaw, extending from the symphysis to the angle and ramus. The parts are very painful and the integuments are tightly stretched over. Internally a large growth occupies the position of the jaw, preventing the opening of the mouth and giving rise to abundant fœtid discharge. The glands beneath the bone and about the parotid are enlarged and painful.

No abatement took place in the progress of the disease. In a fortnight after his admission a vast swelling presented itself beneath the jaw and about the zygoma. In a week further on there were evidences about these swellings of suppuration, so that I relieved them by two free incisions: a large quantity of well-formed pus escaped, such as is ordinarily contained in a common abscess, and some temporary relief was afforded. Exhaustion subsequently set in, and he died April 29th.

Dissection.—The left half of the lower jaw entirely occupied by encephaloid deposit. There was no trace of bone or of the articulation remaining. The outer wall of the antrum was absorbed and the cavity filled by the disease. The parotid and submaxillary glands were similarly affected.

The right side of the jaw was in a natural state, and there were no other deposits of cancerous disease to be found about the body.

A painful example of encephaloid cancer attacking symmetrically the region of the molar teeth in both upper and lower jaws is afforded in the subjoined case, the extent of the disease and the rapidity of its progress precluding all thoughts of surgical aid.

G. E. B., *æt.* 8, a pale, delicate-looking female child, was sent to me by Mr. Boswell, of Redditch, December 7th, 1865, on account of an enlargement of the gums.

History.—The child appears to have been fairly well until a month since, when some spongy growths appeared in the situation of the double teeth. The mother states that the gums were quite clear and natural until the second set of teeth began to appear, when the patient suffered frequently from toothache. Neither parents are very healthy-looking. On the father's side an aunt is reported to have died of cancer of the throat. The child is the eldest of three.

Present condition.—In the situation of the molar teeth, on both upper and lower jaws, appears a soft, spongy, fungous-looking mass. In places this is livid, in others it is covered by a foul, sloughy surface. The incisor teeth, above and below, of the permanent set, are of ordinary appearance, and their surrounding gum is unaffected. The submaxillary glands on either side are enlarged and painful. The state of the child is very distressing, as the discharges from the mouth are offensive and copious, and the breathing is seriously embarrassed.

On December 15th I examined the child again. The growths within the mouth have much enlarged, so that it can now only be opened with difficulty. The face is puffy, the nose spread out, and the eyes almost closed. She can scarcely speak, and her breathing is stertorous. Occasional hæmorrhages take place, and the odour from the discharge is most offensive.

She died of exhaustion on January 3rd, 1866. The disease, from first to last, having run its course in eight weeks.

CHAPTER X.

ENCEPHALOID DISEASE OF THE BREAST.

I HAVE related at page 13 a case of encephaloid cancer of the breast co-existing with scirrhus in the same situation, but I have never, in the course of a surgical experience now of twenty years' duration, had an opportunity of seeing a case of primary encephaloid disease in the mammary gland. Cases, no doubt, frequently occur, and I have seen many such in consultation, in which tumours of various kinds in this region are mistaken for encephaloid cancer. Some of these cases I shall relate at length in this chapter, for the purpose of pointing out the characters whereby they may be distinguished from the disease of which I am now treating.

Encephaloid cancer of the breast almost invariably commences as a small rounded tumour having an irregular, lobulated surface. It is always soft and elastic to the touch; sometimes so soft that it imparts a distinct sense of fluctuation to the finger, and it is, in fact, almost impossible to distinguish it by the touch from a collection of fluid contained in a cyst. This last-mentioned character becomes generally more marked as the tumours increase in size. These tumours usually grow with very great rapidity; but they have very little, if any, tendency to contract adhesions either to the skin or to the muscle beneath them. The skin does not become infiltrated with the cancerous matter as it does in scirrhus; and when the growths are of small size it is usually moveable over them. More or less pain—usually of an intermittent, lancinating character—is generally present, even from their first appearance, but it is seldom very severe at this stage. The nipple is seldom retracted; the axillary glands are also often quite free from tenderness or enlargement, and the general health of the patient may be quite unaffected until the disease has advanced to what we may term its second stage. As the disease progresses the skin covering it becomes thin, of a dusky red colour, and marked by enlarged superficial veins. The tumour becomes much softer—the axillary glands enlarge and frequently grow with great rapidity—the pain becomes more severe and constant—the patient emaciates rapidly and becomes of a sallow colour—and the skin covering the tumour at length either cracks or a small slough appears. Very copious discharges of blood now frequently occur; the ulcerated surface extends with great rapidity; its edges are hard, irregular, and everted; and bleeding fungous growths sprout from its surface and margins. In the intervals between the attacks of hæmorrhage there is a constant very offensive ichorous or sanguino-purulent discharge; the patient's strength now fails rapidly; copious perspirations or diarrhœa frequently occur, often accompanied by the symptoms produced by cancerous deposits in the liver or lungs; and the patient dies exhausted unless previously cut off by an attack of pleurisy, pneumonia, or some other acute disease. The progress of these cases is often very materially hastened by incisions or punctures which have been rashly made into the tumour on the

supposition that they were abscesses or other collections of fluids. Fungous growths, which bleed profusely, protrude from the incision or puncture; the processes of ulceration and sloughing are established, and seem to advance with more than ordinary rapidity; and death soon terminates the sufferings of the patient.

Diagnosis.—The only form of malignant disease with which encephaloid disease of the breast can be confounded is the acute or soft and rapidly growing variety of scirrhus growths. These, however, never attain anything like the size of the encephaloid tumour; they usually commence as infiltrations of the breast tissues; the nipple is generally retracted very early in their progress, and they soon involve the skin and surrounding parts. The axillary glands are also usually affected at a much earlier period than they are in encephaloid disease.

The non-malignant tumours of the breast which may be mistaken for encephaloid disease are (1) adenoid tumours, (2) recurrent fibrous tumours, (3) recurrent proliferous cystic growths.

The three following cases afford excellent illustrations of the history and progress of adenoid tumour of the breast. These growths are of frequent occurrence, and are more commonly mistaken for malignant growths than any other kind of tumours.

They generally commence as a small well-defined tumour in the substance of the breast, which is unattended with pain; they very frequently remain in this state without increasing in size for many years, sometimes, as in the case of Mrs. W., for as many as forty. Then they begin to grow rapidly, without any very obvious cause, and soon involve the whole breast, and often continue to increase until they have attained an enormous size and weight; they are still unaccompanied by pain; they are non-adherent to the surrounding parts; there is no retraction of the nipple and the axillary glands are never affected, nor is there any emaciation or loss of strength until the diseased mass begins to slough. After these tumours have continued in this state for a considerable time the skin ulcerates and fungous protrusions occur; profuse and offensive discharges now take place from the ulcerated part; there is also frequent and profuse hæmorrhage, and the strength of the patient wastes. The ulcer now extends with rapidity, but its margins are never hardened and everted as they are in malignant disease; large sloughing masses of the gland are discharged and the patient dies exhausted, the neighbouring lymphatic glands being unaffected to the last. The history of these cases—as well as their symptoms and the physical character of the breast in its various stages—are so different from those of encephaloid disease that no difficulty ought to occur in their diagnosis.

On January 5th, 1864, I was enabled, through Dr. Walker, of Brierley Hill, to visit and examine the following case of very extensive enlargement of the breast:

Mrs. W., *æt.* 77, a small active-looking woman of very spare frame, and bearing an undistressed appearance.

History.—Forty years ago, after a slight blow on the right breast, a small moveable tumour formed in the upper part above the nipple. This, the first swelling, became, after the lapse of years, lost in a general enlargement of the breast, but the growth of the part was by no means very remarkable until three years since. For many years it was entirely painless, and only of late has given rise to suffering which she describes "as of a wrenching, tearing character." She was married nearly fifty years ago, was never pregnant, had regular menstrual periods, and on their disappearance observed no change in her health or in the breast.

Her family are healthy, and there is no history of cancer amongst its members.

Present condition.—She was in bed for the convenience of examination, and appeared to suffer little from the immense tumour other than from its weight. Her breathing, indeed, was short and somewhat feeble, but this she attributed to chronic asthma, from the effects of which she had long suffered in the winter.

The situation of the right mamma is occupied by a vast tumour of oblong shape, lying with its long diameter across the right side of the thorax and axilla, and hanging downwards as far as the umbilicus. It looks and feels very heavy and solid, and the integuments pass over large elevated masses, which are more especially apparent at its lower margin. Its colour is reddened and somewhat livid at lower part, but at upper there is not much change except in the presence of numerous large veins which descend into its substance from beneath the clavicle.

Near the inner margin the integuments within the last three months have yielded, but no fungus has protruded, merely a flattened, unhealthy ulceration marks the spot. Below this, the situation where the

depression of the nipple is smoothed over is evident. When lifted it is wonderfully heavy, and conveys to the fingers everywhere the feeling of a number of cords twisted and tied together. *Fig.* 8.

Fig. 8.

Taking a measurement of its circumference over its more prominent parts it represents a girth of thirty-six inches.

There are no axillary or other glands enlarged.

Mrs. W. died of exhaustion January 26th, 1864. There was no post mortem examination either of the body or of the tumour.

Mr. Ireland, of Kingswinford, gave me the opportunity of examining the following case on the 9th July, 1860. Mrs. B., a fair-looking, woman *æt.* 47, thin and delicate, eighteen or twenty years previously first noticed a lump of the size of a walnut a little above the centre of the right breast. It was moveable and painless, and remained unaltered for sixteen years or more.

At the end of this time she noticed that it grew, and that in a while the entire breast seemed larger, and that finally the distinctness of the first moveable tumour was lost in the general increase of the part. Still, it did not grow alarmingly fast. Twelve months since this condition of things altered. The increase now become most rapid. In one week she thinks it grew outwardly to the extent of four inches, and thus, in a short time, the breast attained its present bulk.

The patient's health has generally been good. Menstruation commenced at fourteen, and ceased two years since. She is the mother of one child. From the first the growth of the disease has been almost painless. On her mother's side several aunts died of consumption, but there is no history of malignant disease in her family.

Present appearance.—The right breast is enormously enlarged. Taking the nipple as a centre, and then carrying a tape on either side to the wall of the chest, its extent is thirty-four inches, and measuring from above downwards there is but little variation in this, as the growth is wellnigh hemispherical.

It is dusky in colour, shiny, and mapped over by numerous enlarged veins. To the fingers, in places, an indistinct sense of fluctuation is conveyed. Everywhere it is elastic. The nipple is not retracted, but somewhat smaller than natural, and there does not appear to be any attachment of the skin to the tumour beneath. There are no glands enlarged in the axilla or in any other part of the body. It is not painful to the touch, and is distressing from its great size and weight. See Plate x. The left breast is of ordinary dimensions.

For the last four weeks Mrs. B. has kept her bed, and is sensible that rapid emaciation is going forward.

This state of things continued for three months, when on the 14th of October the breast suddenly gave way. Discharges of a most offensive character, mingled with blood, oozed continuously for forty hours, and, leading to exhaustion, terminated her life.

No dissection of the body was permitted beyond an examination of the breast. The remains of this weighed nearly twenty pounds.

On section there was no trace of mammary tissue to be discovered, but the entire body of the tumour was composed of an uniform mass of adenoid structure in various stages of sloughing and decay.

Mrs. M. W., a singularly handsome, healthy-looking woman, was sent to me by Mr. Houghton, of Dudley, on March 10th, 1860, on account of a large swelling of the right breast. On examination it was seen to be of great magnitude, uniformly enlarged, dusky in colour, with numerous prominent veins mapping out its surfaces. The nipple was unaffected, the breast was freely moveable, and there were no enlarged glands anywhere to be detected. To the fingers a sense of semifluidity was conveyed in all parts; but there was nowhere any disposition to thinning of the integuments.

History.—She is forty-two years of age, is the mother of four children, and has once miscarried: her last pregnancy occurred eleven years since.

Twenty years since, before childbearing, she first discovered a lump as large as a marble, apparently solid, and freely moveable, situated about two inches above the right nipple.

The lump never caused her pain or inconvenience except she caught cold or had it bruised, when it would be tender for some few days.

It remained quiescent and painless until Christmas, 1859, when it began to increase slowly and became lost in a general increase of the breast, which during the next three months attained its present magnitude. She states that she has never had real pain, experiencing, in her own words, "a dead numbness," like something "with no feeling in it," as the only sensations.

The breast now measures twenty-seven inches round its base and eighteen inches across its anterior aspect.

Fig. 9.

She states that her family have no history of malignant disease, nor have any members of it died of consumption. She knows of no cause for the tumour, and never had any blow or injury of any kind on the part.

Looking to the perfectly uncomplicated character of the growth, to the absence of any evidence of any internal disease, I recommended her to give herself the chances of an operation. This she refused to do.

The disease went on increasing and the integuments becoming thin; they at length, in about ten weeks from the time of my first seeing her, gave way, and hæmorrhage and fungous protrusions occurred.

Sloughing now rapidly took place, alternating with hæmorrhage. *Fig.* 9. Her strength became exhausted, and she sank and died on July 2nd, 1860.

There were no glands enlarged in the axilla to the last, nor were there deposits in any other parts of the body. The vast tumour had dwindled to a few sloughing masses.

Recurring fibrous tumours of the breast are not likely to be mistaken for encephaloid growths on their first appearance; but, as a rule, these tumours present, after every recurrence, a less and less similarity to fibrous tissue. They become softer and more vascular, and have a great tendency to infiltrate surrounding parts; but the history of their removal and return, without any implication of the lymphatic glands or development of the cancerous cachexia, their smaller size, and the less degree of pain accompanying them, will enable the surgeon to distinguish them without much difficulty. They are, without doubt, very closely allied to encephaloid disease. The following very interesting case will illustrate these remarks.

M. D., *æt.* 23, married, a dark-haired, sallow-complexioned woman, was admitted into the Hospital under my late colleague, Mr. Amphlett, on the 23rd of March, 1853. About fourteen months previously she for the first time noticed a moveable tumour, of the size of a marble, hard and incompressible, and situated on the upper half of the right mamma. It was painless, and did not grow for six months. It then grew rapidly, and continued to do so up to the time of her admission.

She commenced menstruation between thirteen and fourteen, and was married at nineteen. She

bore one child at the full period, and had several miscarriages. She never suckled with this breast, and in no way received any injury. No history of malignant disease in her family.

The breast presented a perfectly uniform enlargement of its entire structure. No separate tumour could be discovered. In size it was as large as a child's head at twelve months. Numerous clear veins traversed its surface, but otherwise the integuments, as well as the nipple, were unaltered. At the upper part a distinct sense of fluctuation was perceptible, elsewhere the general feeling was one of great firmness. The left breast was wasted. The neighbouring glands were unaffected.

On the 9th of April the breast was removed. The skin being abundant and non-adherent a considerable portion was taken away, but the part containing the nipple was left. The interior section of the tumour presented several small cysts, but the main body of the growth was solid, and in colour, consistence, and general appearance it bore a marked resemblance to encephaloid cancer.

The patient made a good recovery, and was discharged, with the wound entirely healed, in four weeks.

September 30th, 1858. M. D. was again admitted into the Hospital, and this time under my care. Nine months after the first operation a small lump had appeared above the line of the cicatrix. This grew slowly, and only seemed to make rapid progress during the last six months. Her general health was satisfactory. The growth was now as large as an orange. Situated above the line of the cicatrix it was freely moveable in the cellular membrane and unadherent to the skin. To the finger it was soft and elastic and eminently vascular, as a little handling induced ecchymoses. Its growth had been unattended by pain.

October 6th. I removed the disease. It greatly resembled the tumour first removed in appearance, and was more than usually vascular.

November 5th. The wound having healed soundly she was discharged.

June 20th, 1859. On examination this day I discovered a small moveable tumour just above the line of the cicatrix, but not attached to it. She looked pale and ill, and stated that there had been a good deal of pain about this growth. I advised her speedy admission that it might be removed.

January 23rd, 1860. Re-admitted. Since the last record a second tumour has shown itself. The larger and first described situated above, and the smaller below the line of the last cicatrix. In characters they are identical with their predecessors, and were growing rapidly, having attained a size equal to a goose's and hen's egg respectively.

February 1st. I removed these growths. There was unusual hæmorrhage, as many as thirteen ligatures being necessary. They were imbedded in the cellular membrane as before, and had the same physical appearances as the other tumours.

March 17th. The wounds were quite healed, and she was once more discharged.

Early in May, 1861. M. D. found that there was again a growth, situated above the lines of the cicatrix. This, after being permitted to attain the size of a hen's egg, I removed on the 25th of September in the same year. Its structure was similar in all respects to the former ones.

November 18th. She was discharged well.

After this, her health being firmly established, M. D. became a sick nurse, and discharged her duties with apparent ease. She nursed several private patients under my observation, and finally became established first as a sitter-up at night and afterwards as a general nurse within the Hospital.

Early in 1863, some fifteen months after the last operation, another tumour appeared. It was not larger than a marble when I first examined it, and was situated, like its fellows, in the cellular membrane above the line of the cicatrix. It was free from pain; in other respects it was similar to those that had been already removed.

It was with difficulty and hesitation that I was made acquainted with this return, notwithstanding I invariably inquired as to her condition. Familiarity with the recurring necessity for the knife served only to aggravate her alarm at the near prospect of its application. I was unable to persuade her to submit to another operation, though I earnestly begged of her to have the tumour removed whilst her general health was unaffected.

In November, 1863, she began to complain of sickness and want of appetite, accompanied by slight cough and fever. Her flesh became more sallow in colour, and well-marked cachexia set in. In a little while she gave up her nursing, and went home to her husband, only, however, to keep her bed with increasing weakness.

About the middle of January, 1864, she spat up clots of blood, having the shape of the bronchial tubes. There was absolute dulness over the lower part of the left lung, with absence of respiratory murmur.

On the 1st of March she was for the last time admitted within the Hospital, and fell under the medical charge of my colleague Dr. James Russell.

Distressing and incessant sickness marked every hour from the time of her admission until her death. She could retain positively nothing on her stomach for more than a few minutes together. The sputa were occasionally rusty-coloured and at times contained pure blood. Exhaustion rapidly followed, and she died on the 7th.

Post mortem.—External aspect of body, yellow and emaciated to the extreme.

Thorax. The left lung was occupied throughout by a deposit similar to the external tumours previously removed in structure and appearance. In various places it had commenced to soften, and in others it was altogether disintegrated.

The right lung was free from disease. The remaining organs were healthy. There were no enlarged glands.

The external tumour was very small and hard, entirely unlike the tumours above described, and bearing a close resemblance, in structure, to an ordinary fibrous tumour.

When the integuments covering a proliferous cyst in the breast have given way and fungous protrusions have occurred, the appearance presented by the disease may be readily mistaken for that of soft cancer in its ulcerating stage; and this error is, of course, more likely to be committed when the original disease has been removed and the proliferous growth has speedily reappeared in the same situation. This occurred in the subjoined case, for the notes of which I am indebted to Dr. Steell, the present House Surgeon to the General Hospital.

S. H., a strong, healthy-looking woman, *æt.* 22, came to the Hospital January 14th, 1866, and was admitted under the care of Mr. Crompton. She had then a distinctly fluctuating swelling of left mamma, about the size of newly-born child's head. Integuments over the swelling hot and reddened: painful on pressure; no enlarged glands in axilla or above the clavicle; swelling cannot in any way be separated from the mammary gland; nipple normal. She complains of great pain in the tumour of a throbbing character. Textures around the fluctuating mass slightly indurated, like to inflammatory exudation.

States that six weeks before she knocked her breast against a bedpost, and that a fortnight after receiving the blow (*i. e.* four weeks ago) she had a severe and prolonged shivering.

It being probable that the fluid in the tumour was of a purulent character, a bistoury was plunged into the swelling, giving exit to a gush of blood. On thrusting the finger into the cavity a considerable mass of blood-clot was felt and removed, but still there was the feeling of more clot adherent to the lining membrane of the sac.

As by this time, however, the hæmorrhage had become so profuse as in a few minutes to blanch the patient, it became necessary to stuff forcibly the whole cavity with strips of lint, it appearing at the time that the soft mass felt by the finger was another clot, though, owing to the bleeding, an exact examination of it was impossible.

Two days after the lint was removed; suppuration of the lining membrane of the sac ensued, accompanied with the extrusion of more blood-clots.

She had a rather smart attack of inflammatory fever, but in the course of ten days she was, as she herself expressed it, as well as she had ever been in her life, and the breast had regained nearly its normal size, the original wound remaining open only a little larger than an ordinary sinus.

Gradually, however, the breast again enlarged at the site of the old sac, the edges of the opening pouted, and there was a fœtid sanious discharge which increased in quantity every day. Slowly a fungous-looking mass projected through the opening. This fungoid projection, with general swelling of the breast of a soft pulpy character, increased with awful rapidity; and, coincidently, the general health became rapidly affected, irritative type of fever of the most severe character supervened, and she seemed in a dying state. *Fig.* 10.

Fig. 10.

No trace of disease in any other part of the body could be discovered; glands in axilla and above the clavicle still unaffected.

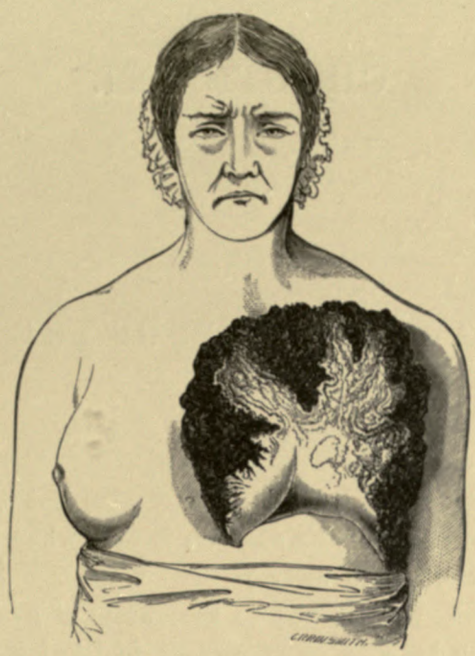
The whole mass was removed by Mr. Crompton on March 3rd, leaving, however, a small part of the gland, which was apparently healthy. The wound healed nearly entirely by primary union; and she speedily regained her former robust health.

Six weeks after operation, her health being still good, a soft swelling appeared at the line of, but not affecting the scar of the primary operation.

This mass was removed also by the knife, and again the wound healed by the first intention.

A third tumour was removed, with a similar result, on May 3rd; but after this her health speedily broke down, a fungoid soft mass burst from the whole line of the original scar, bleeding often so profusely as to place her life in immediate danger. The fungus again grew with fearful rapidity, accompanied with symptoms resembling the worst forms of irritative fever, and she died, apparently by septicæmia, on May 28th, by which time the tumour had acquired an enormous size, its long diameter measuring fifteen inches. *Fig.* 11.

Fig. 11.



On post mortem examination every organ of the body appeared healthy: there was a small mucous polypus of uterus. Microscopically all the tumours were composed almost entirely of cells, small, not polynucleated, and of a pretty uniform shape and size.

The history of the case, the absence of the glandular affections and of secondary deposits, are the chief points on which the diagnosis must be founded.

CHAPTER XI.

ENCEPHALOID CANCER OF THE TESTICLE.

ENCEPHALOID cancer attacks the testicle at any age, but the period in which it will most commonly demand the attention of the surgeon is that when the sexual functions are in fullest activity, between the ages of thirty and forty years.

Its first appearance is often attributed to the effects of a slight blow or strain; and, in the cases which I have seen, it has been as often present in the left as in the right.

It commences in the gland itself, and gradually spreads from the midst of the seminiferous tubes. For a long time, and in some cases altogether, the tunica albuginea resists the advance of the disease; but, at length giving way, the scrotum becomes distended, the numerous veins on its surface become enlarged, and its rugæ disappear. If the growth be of large size the position of the raphe becomes changed from the median line and the penis is tucked in. Not unfrequently there is hydrocele of the tunica vaginalis before the tunica albuginea has given way.

In the second stage the general health is affected. The patient thins and the complexion assumes a straw yellow tint. Coincident with this the internal lymphatic glands take on enlargement. Those lying in the lumbar region, by the side of the aorta especially, form large tumours of encephaloid cancer, encroaching on the diaphragm, and inducing difficulty of breathing in some instances, and in others by pressure on the great veins leading to effusions into the cavity of the peritoneum and to anasarca of the lower extremities.

The spermatic cord becomes thickened, and in rare instances, because of the strong fibrous coverings that resist the outgrowth of the disease, the skin of the scrotum gives way and a fungous tumour presents itself.

In the end death takes place by exhaustion, induced either by the rapid multiplication of the internal disease or by the effects of the bleedings and discharges that arise from the fungous tumour.

Mr. D., *æt.* 43, a strong, vigorous-looking man, consulted me regarding his right testis, April 30th, 1863.

History.—Eight months since, without known cause, the right testis began to enlarge. The enlargement was without pain. He never had a blow or strain or suffered from syphilis. For the last six months has had pain in the lumbar region, and thinks he is thinner. There is no history of cancer in his family.

Present condition.—The affected testis is large, heavy, and ovoid in shape. The skin of the scrotum is free, but its wrinkles are gone and numerous enlarged veins traverse the surface of the tumour. There are no diseased glands to be detected. On the same side there is an inguinal hernia, readily reducible, and for which a truss is constantly worn.

I had no doubt of the disease being encephaloid cancer, but in order to be able to give a more positive opinion I punctured the centre of the swelling and obtained only blood through the canula.

I now informed his friends that the case was one of cancer, and I advised an immediate removal of the part. The patient, however, hoped otherwise, and I did not see him again for a month. I then visited him with his surgeon, Mr. CARTWRIGHT. The testis had increased to twice the dimensions it had when I first saw him. It was still without pain; the skin was unaffected and there were no enlarged glands. I again expressed the opinion I had already given of the nature of the complaint and of the only mode of treatment that should be followed. He still would not assent to this view of his case, and died without interference, exhausted, by the gradual progress of his disease, on the 28th of August in the same year. I learned that the tumour attained still greater dimensions without breaking, and that the lumbar glands became involved.

Symptoms.—The testicle becomes the seat of occasional pains of a vague character. It assumes an ovoid lengthened shape; and with this increase in size there is a sense of dragging and weight at the cord. Its surface is regular and its consistence generally elastic, or firm in some places and elastic in others.

The pains are at first slight, but after a time dependent mainly on the weight of the tumour. They are of a lancinating character. As the disease advances severe dull pains extend along the cord, in the groins and inner side of the thigh, and, finally, in the iliac and lumbar regions.

J. K., *æt.* 32, a labourer, a strongly-built, dark-complexioned man, was admitted under my care in the Hospital April 18th, 1862, on account of an enlargement of the left testis.

History.—Six months previously he noticed that the left testis was larger than the right, but as he had no pain he forgot the circumstance until two months ago when he accidentally bruised the part whilst sinking a well. After this he had pain, and rapid enlargement occurred. The swelling was punctured, but only blood escaped. His general health had hitherto been good, and there was no history of cancer in his family.

Present condition.—The affected testicle forms a tumour as large as the closed hands. It is oval in figure, uniformly enlarged, and conveying a sense of weight when handled. In places there is a feeling of fluctuation. There is no pain in the part—the cord is well defined; and, but for a little thinning, and some dull dragging pains in the left loin, the patient is as well as ever. There are no enlarged glands to be detected.

April 23rd.—Under chloroform I excised the disease. It turned out to be a well-marked specimen of encephaloid cancer intermingled with numerous cysts.

The patient made a tardy recovery, the closing of the wound being hindered by a severe attack of sloughing which assumed the phagedænic character; at the end of two months, however, he was discharged, with the wound sound and his general health in good condition.

After his discharge he resumed his employment, and remained in strong health. I saw him on July 31st, 1863, fifteen months after the operation: he looked well. The seat of wound was sound, and there were no enlarged glands to be detected in its vicinity. He told me that he felt well, and, in answer to my question, stated that his sexual feelings were vigorous. I found a large tumour in the space between the anterior edge of the sterno-mastoid and the jaw on the left side, reaching downwards towards the clavicle. It was moveable in the cellular membrane, without pain, and had been observed by him about six or seven weeks.

August 21st.—He was admitted again. On examination, the cervical tumour was found much enlarged; the skin was adherent on the most prominent part, being changed in colour and threatening to give way. Emaciation had set in accompanied by marked cachexia. The breathing was distressing, but there were no evidences of deposits in the lungs.

He became gradually weaker, and his friends removed him on September 9th, without my knowledge, and on the following day he died.

I was unable to obtain a post mortem examination.

Up to the last this patient was free from any external evidence of the secondary appearance of the disease in the glands of the groin, and, as far as could be ascertained, in those of the lumbar regions.

Diagnosis.—Encephaloid cancer of the testicle, in its earlier stages, may be mistaken for (1) hydrocele, (2) hæmatocele, (3) scrofulous disease, (4) syphilitic disease, (5) cystic disease. I shall proceed to point out the features by which these several affections may be recognised.

Hydrocele in shape is pyriform. It commences from below upwards; and, being permitted to attain great dimensions, gives rise to no other inconvenience than what arises from the stretching of the parts and its weight. It is transparent, and, when uplifted in the hollow of the palm, feels light for its size. The sensation of universal elasticity is very marked in hydrocele, and the situation of the testicle can constantly be ascertained by firm pressure in the midst of the fluid.

It is otherwise with cancer; for, with all its elasticity, some firmer portions than others can generally be detected, whilst the existence of the testicle—the disease being advanced—can not be determined. To these must be added the rapid advance of cancer; its effect on the general health; and, lastly, the test of puncture.

Hæmatocele has often been mistaken for cancer. It differs from it in being the direct result of a blow, or other injury; and the scrotum will often evidence this by external ecchymosis. When, however, the first effects of the accident have passed away, and the fluid portions of the effused blood have been taken up, leaving only indurated walls and solid clots behind, the diagnosis from the early stage of cancer is very difficult. Here, moreover, the test of puncture fails to throw light. The surgeon must, therefore, rely mainly on the history of the case before him, the progress of the disease constituting the sole reliable basis on which to found an opinion.

The following case exhibits a complication in which hæmatocele was only relieved to determine apparently the production of cancer.

E. T., *æt.* 36, married, a butler in a gentleman's service—a stout, vigorous man—was admitted under my care in the Hospital February 27th, 1855, on account of an enlargement of the left testicle.

History.—Eight months since, whilst riding on horseback, he bruised the left testicle severely against the pommel of the saddle. The immediate effects of the injury were such as to require leeches and fomentations; but he did not keep quiet long enough to get quite well—a marked increase in the size of the part remaining when he resumed his occupation. Finding that it still grew and was becoming painful he sought admission into the Hospital.

Present condition.—Testicle very large, fully distending the scrotum. Skin smooth, in places reddened and traversed by large veins. He has great pain, both in the tumour and in the groin and lumbar regions. The glands are unaffected. There appearing to be a feeling of fluctuation in front, and, having regard to the mode of origin of the swelling, I expressed an opinion that the disease was probably hæmatocele. As a tentative proceeding I introduced a trochar, but only a small quantity of fluid blood escaped. I now proposed to my patient to make a free incision into the part, with the view of ascertaining the exact nature of the disease, and to be prepared to submit to excision in case I found it was cancer.

Accordingly, March 7th, under chloroform, I made a free incision from above downwards, commencing just below the external abdominal ring. The first plunge relieved a hydrocele located in the textures of the cord, the main tumour being unaltered below; on entering this its contents presented the ordinary appearances found in hæmatocele. Having emptied the cavity of the tunica vaginalis of the clots, which were old and firm, there appeared nothing left of the former tumour but the compressed remains of the testicle and the thickened walls of the scrotum. I formed the opinion that the case was one of simple traumatic hæmatocele, complicated by hydrocele of the cord, and that speedy recovery would take place.

17th March.—The wound suppurating favourably.

24th.—I noticed a mass of fungous-looking granulations springing up from the edges of the wound, and that the part generally was larger than previously. Patient looks pale and thin.

28th.—Excised the contents of the scrotum, and found the cord at its point of division thicker than natural.

On examining the parts removed there were no traces of the structure of the testicle or its coverings to be discovered, but on section the well-marked appearances of encephaloid cancer were everywhere present.

April 28th.—Wound nearly closed. Fungous granulations are present at extremity of cord.

May 5th.—He left the Hospital, a distinct tumour forming in the structure of the cord, at the internal ring. He died in some three or four weeks subsequently with marked symptoms of the internal development of encephaloid cancer.

There was no dissection.

Scrofulous or tubercular disease when it attacks the testicle usually does so in the presence of the scrofulous diathesis developed in other parts of the body at the same time. The tumour formed is very painless, of a size far below that of cancer, and yielding on examination a varying sense of marked softness and indurated knobs. It shows an early tendency to penetrate the skin, forming abscesses and ulcerations unattended by hæmorrhage or sloughing. The mushroom-like fungus in this disease is essentially benign, and produces little or no effect on the general health.

F. M. C., *æt.* 25, a pale, somewhat unhealthy-looking man, by occupation a shoemaker, married and without family, was sent to me at the Hospital by Mr. Mason, of Burton-on-Trent, March 7th, 1863, on account of a large swelling situated in the left groin.

History.—Has been aware from early years that the testicle on the left side had not descended into the scrotum. He never suffered pain or inconvenience from this until about two years ago, when, after a hard day's work, he became sensible of a dull, heavy feeling in the part as it lay in the groin. Up to nine months since there was little change in the size of the testicle, but there was more pain in it. About this time he suffered a good deal from constipation, and strained violently at stool, and took large quantities of purgative medicines. He now observed that the testicle was getting larger: with this increase there was additional pain, of a dull character by day, and at night of a darting, cutting nature, greatly aggravated at times, and inducing loss of rest. He states that he never sustained any injury to the part, and that he never suffered from syphilis. There is no history of cancer in his family. Latterly the persistence of the pain has affected his general health.

Present condition.—The seat of the undescended testicle is occupied by an oval tumour measuring five inches in length, and lying with its long axis in the inguinal canal.

On handling it there is not much pain produced, but there is a marked feeling of fluidity conveyed. The integuments are wholly unchanged, and there are no enlarged glands. On uncovering the glans penis there are traces of venereal warts.

March 11th.—Under chloroform I proceeded to excise the disease. Passing inwards a trochar into the most fluctuating part I evacuated four ounces of fluid resembling that contained in an ordinary hydrocele. The solid portion turned out readily from its resting-place, and the operation was speedily concluded.

On examination the structure presented an uniform firm section of whitish colour, interspersed with distinct yellow patches of various sizes. Some of these were of considerable size and more or less soft.

Dr. ANDERSON, the Resident House Physician, reported that "sections of the firm, white part were found to consist of densely fibrous structure; and in the soft yellow spots, numerous epithelial cells and amorphous matter were discovered."

The patient recovered without a bad symptom, and was discharged, well, April 10th.

He subsequently became the subject of what appeared to be pulmonary consumption, and died February 6th, 1864. There was no change in or near the seat of operation.

There was no post mortem examination.

The inguinal glands are not unfrequently enlarged in these cases, whereas it is very unusual to find them affected in cases of encephaloid cancer of the testicle. In a case sent to me in the summer of 1865, by Mr. UNDERHILL, of Great Bridge, where I removed the testicle in a young man for evident scrofulous disease, the inguinal glands were greatly enlarged in both groins—a fact that led me to give a very decided opinion that the disease was non-malignant, an opinion, the correctness of which has been borne out by the restoration to health of the patient.

The syphilitic disease of the testicle should be distinguished by its antecedents. In the absence, however, of being able to trace certainly the previous existence of chancre the attention of the surgeon should be directed to the following points: The pains attendant on its origin are comparatively severe, but diminish as the tumour increases, and finally disappear altogether. Its dimensions are never great; it is uniformly firm in consistence, without tendency to softening, to affect the health of the skin, or to produce adhesion. Not unfrequently both testicles are attacked by syphilis, which is never the case with cancer; but, above all, the syphilitic disease yields to specific medical treatment—the cancerous advances despite any known internal remedy.

Cystic disease of the testicle, in the cases I have seen, has not afforded any signs whereby it could be distinguished from encephaloid cancer arrived at that stage when the surgeon would recommend castration as the only remedy. But as cystic disease requires for itself the same treatment, its discrimination from cancer, so far as surgery is concerned, is unimportant, whilst the appearance of the tumour, on section, will readily enable the operator to predict for his patient that certain immunity from recurrence which attends the removal of this form of benign growth.

In all cases of contemplated excision of the testicle the tumour should be punctured previously.

Treatment.—The only remedy applicable in cases of cancer of the testicle is castration. This should be adopted in the earliest possible stage before the general health has become affected.

In the experience of surgeons the operation of castration is not attended with danger. I have not, myself, seen a fatal result in consequence of its performance, nor, indeed, have I witnessed any complications retarding the ordinarily rapid recovery of the patient's health.

The operation should not be recommended when the lumbar glands are involved, or when there is any suspicion of secondary disease having commenced elsewhere.

The facts I have just stated induce me strongly to urge patients not to delay submitting to this proceeding where the symptoms leave no doubt as to the true nature of the disease. The subsequent immunity from the re-development of the cancer may be brief or otherwise, and hitherto experience points out that the chances are in favour of comparatively speedy recurrence, but I am satisfied that the patient will endure less suffering from having lost the local disease by operation, than he will encounter in the probable advent of a sloughing fungus added to the formations of the cancer internally, which in either case ultimately destroy life.

Excision of the testicle may be accomplished in the following manner:

Chloroform having been administered, the patient, lying in the recumbent position, should have his legs placed widely asunder so as to hang over the end of the table. Grasping the diseased organ in the hollow of his left hand, and standing between the legs of his patient, the surgeon carries an incision from the apex of the tumour to its base. The point at which this commences will usually be opposite the situation of the external abdominal ring, or a little below it, and in its course it will traverse the long axis of the swelling, and should divide completely the skin, so as to expose in its whole length the immediate covering of the tumour. If there be no adhesion of the skin, a little tearing with the fingers and a few touches with the knife ordinarily suffice to set it free. Where it is otherwise, and the use of the knife becomes necessary, care must be taken not to wound the septum scroti, and in order to secure this, its edge must be kept well directed against the body of the tumour. The mass may now be held up and slightly put on the stretch so as to render distinct the position of the cord. Through this, where it escapes from the ring, an eyed needle, armed with a double thread, well waxed, is to be passed by an assistant, and the two ends having been tightly tied, the cord is to be severed below. The mouths of the arteries that accompany the vas deferens are now readily seen and secured, and when this has been done the ligatures around the cord itself should be removed.

The careful ligature of the cord is the only important matter connected with this operation; and too great care cannot be taken to avoid its escape along the inguinal canal. Any assistant, however expert he may be, will from time to time allow the divided cord to slip from his grasp; and in order to avoid a mishap that is troublesome, and even dangerous, I invariably secure it in the way I have described, half an inch above the point where I intend to sever it. In all cases of malignant disease affecting the testicle, it should be divided as far away from the tumour as possible, and in some cases it will be desirable to dissect up some little way along the canal in order that a perfectly healthy part may be secured.

In hardly any case is it desirable to leave the cord secured by the ligature *en masse* to await a tedious freedom by sloughing. Very often it has remained long after all other portions of the wound have become sound, and under any circumstances its presence cannot fail to give rise to annoyance and pain.

As there are often some small vessels which bleed from the cellular tissue of the scrotum and from the neighbourhood of the septum it is prudent not to dress the wound until after the lapse of a few hours.

It is hardly ever necessary to take away integument, as the skin, however much stretched by the size of the growth, rapidly contracts after its removal.

In dressing, too much stress cannot be laid on the importance of keeping the scrotum well raised by a pillow, placed between the thighs, and of retaining a free opening at the lower end of the wound for the escape of discharges.

CHAPTER XII.

ENCEPHALOID CANCER CONTIGUOUS TO BONE.

ENCEPHALOID cancer frequently presents itself in the form of a primary tumour, having its situation in the intermuscular spaces of the trunk and extremities. My own observation leads me to think that these tumours, for the most part, originate external to the periosteum, in the cellular tissue between it and the deeper muscles by which it is covered.

The favourite places in which these tumours appear are about the lower end of the femur and the upper end of the tibia. They are not uncommon at the upper part of the thigh and about the pelvis, and are more rarely met with around the ankle and in the foot. In the upper extremity we encounter them chiefly about the shoulder and scapula.

Their appearance is often attributed to a blow or some other injury, and in many cases—perhaps the majority—they arise without known cause, and are met with at any age.

Symptoms.—The patient discovers a small swelling placed deeply in one of the situations referred to. In shape it is irregular, though mostly rounded—more or less moveable—firm and elastic—and generally unattended by pain. As the swelling increases its outlines become obscure. It pushes its way in between the muscles and along the bones, altering their form and limiting their functions. In the case of a joint, like the knee, the swelling not unfrequently fills in the popliteal space, absolutely arresting the power to flex the leg; and, by interfering with the arterial and venous trunks, gives rise to venous engorgements and œdema around and below the seat of disease. Notwithstanding this increase, the surgeon can still make out that the tumour does not grow from the bone and periosteum—an indistinct mobility, on firm handling, will enable him to decide on a matter that, as I shall presently point out, may materially affect the treatment to be followed.

The pain, with the advance of the disease, may become severe; but this will depend mainly on the character of the parts by which the growth is surrounded, and the amount of motion to which they are subjected. As a rule, the amount of pain experienced, when the tumour is small, is not of much moment.

At length, the general health of the patient suffers. The adjacent glands enlarge; and, with this contamination of the system, the tumour itself speedily enters on its last stage.

In the earlier, and even in the later, stages of these tumours they constantly convey the most deceptive sense of fluctuation to the touch; and the absence of fluid in them can only be determined with certainty by an exploratory puncture.

The integuments for a long while remain unchanged, until the growths from beneath uplift them in irregular lobes. They then become thin and livid in colour, and numerous veins appear

beneath them or in their vicinity. Finally, they give way at one or more points, and fungous protrusions, hæmorrhages, and sloughings occur.

Until the sloughing stage of these tumours is established the surrounding soft parts are rather stretched—absorbed and pushed on one side—than occupied by deposits of the cancer.

In like manner the adjacent bone is not infiltrated. The periosteum is, however, eroded, and its compact walls become thinned and absorbed. In the case of tumours encircling the long bones, pressure alone effects changes that renders them liable to fracture on the slightest injury or unusual movement.

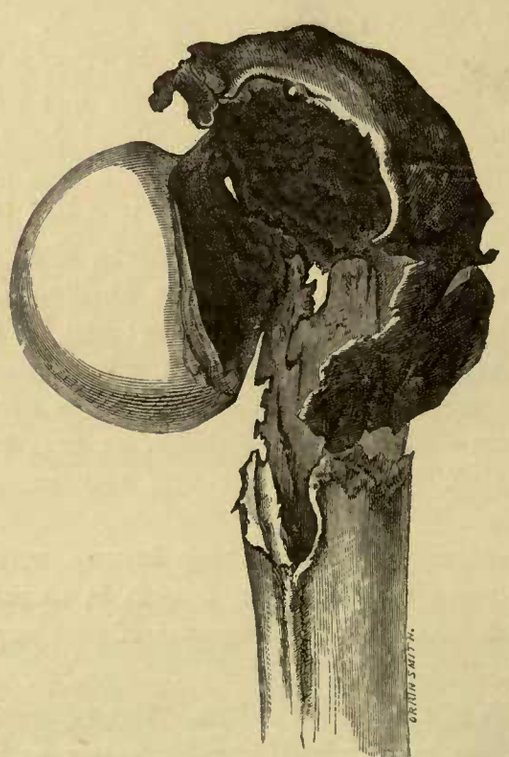
The following cases are interesting examples of the peculiar circumstances under which the shafts of bones become thin and affected by the pressure of adjacent cancerous tumours, affording a contrast to those cases of fracture which are consequent on the deposits of cancerous matter in the bone tissues, as well as to those rarer cases in which it arises from the abnormal fragility resulting from mal-nutrition and cancerous cachexia.

G. W., *æt.* 56, married, by occupation a tool maker, a cachectic-looking man, was admitted into the General Hospital, under the care of Mr. Crompton, February 6th, 1850, having an ununited fracture situated at the upper part of the right thigh.

History.—Has been a hard-working man of steady, sober habits, never having had previous disease of importance. Five months since, whilst engaged at his business, he fell down suddenly and heavily upon his hip. He managed to walk home, but in great pain. When examined by his medical attendant no fracture of the limb was detected, and the accident was regarded as a contusion. A month after this, whilst standing by his bedside, he felt something give way in his thigh at the seat of injury; he was unable to get into his bed without assistance, and has not been able to stand since. On being examined a week ago, a fracture about the trochanter was detected, and he was sent to the Hospital.

Present condition.—Affected limb, œdematous, shortened an inch, everted, very moveable and yielding crepitus. Marked debility present, complicated by diarrhœa, and a sacral bed-sore.

Fig. 12.



Being resident surgeon at this time, I applied splints to the broken limb, placing the patient on his side. Subsequently a starched bandage was applied, but no repair took place, and he died on March 13th.

Dissection twenty-four hours after death. Body emaciated, and of a tallow-like colour. Head.—The substance of the brain was softer than natural, and there was considerable effusion of clear serum into the lateral ventricles—the dura mater was very adherent. Thorax.—Old pleuritic bands generally present—the right lung was congested, and broke down readily under pressure from the fingers—the left emitted

a marked gangrenous odour, and at its base and inferior portion was completely disorganised. Abdomen.—The right kidney of twice its natural size. On section, the upper two-thirds were seen to be occupied by a mass having the appearance of encephaloid cancer, whilst the remaining third was composed of pale kidney structure. The left kidney and the other viscera were natural. On examining the broken bone, the neck of the femur was seen to be encircled by a mass of diseased structure, having, on section, the appearances of encephaloid cancer. The soft parts around were infiltrated by this, and the interval of bone between the head and trochanter well nigh completely absorbed. A section of the shaft below this was healthy. *Fig.* 12. The fracture extended, in an oblique direction, completely through the neck of the bone. There was no disease discoverable in the other bones.

E. K., *æt.* 53, married, a worn, miserable-looking woman, was admitted under my care in the Hospital January 14th, 1860, on account of a fracture of the right thigh.

History.—Twelve or thirteen years since, soon after a severe illness, she noticed that the middle of the left arm was the seat of frequent pains. She could find no explanation of this in the appearance of the limb, until after a period of some three years, when she discovered a hard swelling of small size, which seemed, to her, to be connected with the bone. Its increase was slow for five years, but afterwards there was a marked change in this respect. She gradually lost power over the limb; the tumour became as large as the closed hands, and occasioned a good deal of suffering. During all this she had emaciated and lost power over her legs; and on going up stairs, three weeks ago, she slipped and felt something crack and give way in her right thigh.

Present state.—The right thigh is broken in middle third. There is no feeling of thickening about the ends of the fracture, which overlap each other. The limb is shortened between two and three inches. The left upper arm presents an oval-shaped tumour situated in the middle of the humerus, which has given way about the centre of the growth. There is no crepitus; and, as there has long been loss of power over the limb, the fact that the arm bone was broken has not been recognised by the patient or her husband. The tumour is moderately firm, with the skin unbroken, but discoloured and traversed by enlarged veins. There are no glands enlarged in the axilla.

On the sacrum there is a large bed-sore.

An attempt was made to obtain action in the fracture of the thigh, but without avail, and she died on the 8th of February.

Dissection twenty-four hours after death.

Head.—Brain and membranes natural. Penetrating the internal table of the skull on the left side and corresponding to situation of temporal fossa was a mass as large as a pigeon's egg, having the characters of encephaloid cancer. It appeared to have arisen from the diploe, and to have absorbed the inner table in its passage inwards.

Thorax.—Contents natural. Abdomen.—Liver, the posterior margin of right lobe occupied, beneath its peritoneal coat, by a large deposit of encephaloid cancer, measuring three inches in diameter. Other parts natural.

On making a section of the tumour in the arm it presented the well-marked appearances belonging to an encephaloid cancer. It completely encircled the bone, and filled up a considerable interval between the broken ends. These were rough and irregularly jagged with tooth-like processes, but the structure of the bone was not softened.

The body was removed by the friends before the thigh bone could be examined.

The ordinary course of this disease, unarrested by operation, is exhibited in the two following cases.

A. H., *æt* 40, a stout, tall, healthy-looking country woman, was admitted under my care in the General Hospital, May 6th, 1856, with a large tumour in connexion with the inner side of the right thigh.

History.—Four years since she perceived a small swelling on the inner side and a little above the right knee; she knew of no cause likely to have induced its appearance. She took little notice of this for a long time, pursuing her out-door avocation, principally consisting of gathering cresses and vegetables, without hindrance. The swelling, however, grew at the end of two years more rapidly, and, since, it has attained without interference its present condition.

Throughout she steadily refused to have advice until her friends compelled her to place herself under my notice. She states that, to the best of her knowledge, none of her blood relatives have been the subjects of tumours of any kind.

Present condition.—The growth occupies the anterior and inner parts of the thigh in its middle and lower thirds. It overhangs the knee so as to obscure the patella, but not so as to impede to any serious extent the movements of the articulation. A smaller division of the disease occupies the popliteal space on the inner side, and the whole mass is gradually lost upwards in the natural dimensions of the thigh. It is unattached to the bone, being moveable with surrounding textures on firm handling. The skin covering it is slightly reddened, somewhat shiny, and traversed by enlarged veins. There are no enlarged glands in the groin, and the leg is not œdematous.

She is free from pain in the tumour except after prolonged standing.

May 30th. Having refused to submit to amputation of the thigh, which I recommended, she left the Hospital this day.

May 14th, 1857. A period of twelve months having elapsed she called upon me. The tumour has immensely increased and measures in its widest circumference two feet nine inches. The integuments are yet unbroken, and, despite the unwieldy character of the part, the movements of the knee are remarkably unimpeded. There are no enlarged glands in the groin. There are, however, evidences of secondary deposit in the presence of two firm tumours, as large as geese eggs, in the abdominal wall, occupying the subcutaneous cellular membrane; one of these is situated on the left side, just below the umbilicus, and the other in the left labium pudendi; a somewhat harder tumour, of the size of a chestnut, is situated at the upper part of the left breast. These are all moveable and painless. She is still well in health, and looks but little thinner than when in Hospital. The tumours referred to made their appearance about six months since.

This patient died exhausted on the 3rd of December in the same year. Mr. Fletcher, of Bromsgrove, was good enough to furnish me with a few notes of her condition at last—no internal post mortem examination being allowed. There was a large tumour on the outer side of the left thigh; one on the left side of the pubis, with a sloughing wound upon it of about two inches in diameter. Immediately above this was a large, prominent tumour, measuring one foot three inches in circumference; a large one, also, over the region of the spleen; together with many smaller ones scattered about the abdomen and chest. All these tumours were seated in the cellular membrane. A portion of one of these deposits sent to me presented all the appearances indicative of encephaloid cancer.

In August, 1853, at the request of Mr. Riley, formerly of this town, I visited the daughter of Mr. W., at Ashted, who was the subject of a large tumour growing from the left shoulder.

I found an interesting child, *æt.* 7, not much lowered in general appearance, and about whose case the following history was told: Twelve months previously, without known cause, a small moveable tumour, of the size of a hen's egg, was discovered near the spine of the left scapula. It was without pain; and as the general health was not affected the growth was not interfered with. It grew, at first slowly, then rapidly, and the last month has been distressing from size and weight.

Present condition.—Hanging from left shoulder behind is a large globular swelling, having its skin tense, livid in colour, and traversed by numerous veins. It extends to the opposite side, half over the right scapula, and downwards as low as the last ribs. The movements of the shoulder-joint are everywhere free, except posteriorly. To the feel it is elastic, and semifluctuating in places—nowhere hard. Being grasped with both hands it can be raised slightly, and with it the scapula also. There was no pain in it, only inconvenience from size and weight. *Fig.* 13. The axillary glands were only slightly enlarged.

Fig. 13.

I expressed an opinion that the tumour was an encephaloid cancer, and that it had arisen in the parts outside the periosteum of the scapula in the first instance, gradually attaching and spreading itself to surrounding textures as it grew to its present dimensions; further, that no operative interference could be thought of on account of the hæmorrhage that must attend any use of the knife.

I subsequently learned that about a week after my visit the swelling gave way, and that the child speedily sank from exhaustion.

There was no examination after death.

Diagnosis.—The recognition of the character of these tumours is not unattended with difficulty. In their earlier stages of development they may for a long time escape detection, as they rarely occasion pain, and are deeply placed; and even when of large dimensions they may produce so little inconvenience that the patient is disinclined to view them seriously.

In a very early stage indeed it would be difficult, if not impossible, to lay down any rules by which these tumours might with certainty be distinguished from others of a less malignant character. Nor is this, happily, a matter of much importance, as no surgeon would recommend any interference with them when producing neither pain nor inconvenience, and advancing slowly.

In a later stage, however, when their volume has increased, and they tend towards the skin, they may be mistaken for (1) chronic deep-seated abscess, (2) aneurism, (3) fibro-cellular tumours, (4) fibro-plastic tumours.

A chronic abscess is generally the consequence of some previously existing morbid condition, whereas malignant tumours about bone are usually the first symptoms of disease—the constitutional ones following afterwards. The chronic abscesses usually affect the centres of limbs, whilst maglignant growths more often attack the extremities. A chronic abscess is not usually in contact with the surface of bone unless when it arises from previously existing diseases of the bone itself, of which there would be afforded well marked symptoms, whilst the malignant disease, of which we are speaking, originates in immediate contact with the bone.

The constitutional symptoms of chronic abscess as it approaches maturity are those of hectic fever, whilst those attending the malignant growth are characterized by the features belonging to cancerous cachexia.

When the glands in the groin become enlarged, as they frequently do in connexion with chronic abscess, this occurs at a much earlier period in the progress of the case than it does when they become enlarged as a sequence of malignant disease.

Finally, true fluctuation is present in the chronic abscess which discharges pus on being punctured, and from first to last runs its course with little or no pain. On the other hand, the sense of fluctuation in the malignant tumour is altogether deceptive, yielding blood only on puncture in the majority of cases, or if a cyst be opened, its contents, which can scarcely be confounded with pus, in addition to the blood; further, the pains, at first slight, and of a lancinating character, steadily increase in severity as the disease progresses.

Aneurism in its origin is either traumatic or spontaneous. In the former the history suffices for its diagnosis. In the latter there will be, almost certainly, disease in the heart or other vessels. The progress of aneurism is slow; that of malignant disease rapid. An aneurism yields an expansive throb which generally pervades the whole tumour, whilst the malignant one is simply uplifted by pulsations of the artery beneath.

In a case, however, where, notwithstanding, careful observation of the symptoms present, the true nature of the disease remained in doubt, the main artery of the limb should be tied above the tumour, as a last alternative, to establish a diagnosis, when its subsequent continued growth would remove all doubt as to its malignant character.

The origin of the disease in the following case, near to the course of the popliteal artery, and its subsequent increase tending to obstruct the free passage of blood by filling in the space through which it passed, gave rise to symptoms of obstruction in that vessel, accompanied by pulsations, that were well marked.

C. M. R., *æt.* 33, married, a gas-fitter by trade, of pale and emaciated appearance, was admitted under my care in the Hospital August 31st, 1857, with a large swelling of the lower part of the left femur.

History.—Eighteen months previously he felt a shooting pain under the cap of his left knee when walking. This continued until November last, when he sprained his leg; afterwards, the knee began to swell, which aggravated the pain and lameness. In January last he slipped down, and afterwards the swelling increased considerably, though this did not for some time interfere with his following his usual employment. The

swelling remained stationary for some weeks, and about three months ago an enlargement began to form behind the inner condyle of the femur. It was at first about the size of a walnut, and firm, and from this point it extended rapidly around the knee-joint, forming one large swelling, producing much acute pain, and preventing extension of the leg.

Present condition.—The tumour is large, of an oval shape; it occupies rather more than a third of the lower part of the thigh, knee-joint, and upper part of the tibia. Above, it is distinct, prominent, and well defined, particularly on the inner side, where it is crossed by large and distended veins. Below, it is gradually lost in the inferior part of the leg, which is œdematous. The swelling is firm and elastic, and in part conveys to the touch the hardness of a bony growth. Distinct pulsation can be felt on the inner side where a bruit can be heard, and less distinctly, also, on the outer side of the swelling. A distinct and low bruit is also heard in the course of the femoral artery. The pain suffered is very great.

The inguinal glands are enlarged.

As the tumour was increasing, and his general health giving way, amputation, as a palliative measure, was resorted to by my colleague Mr. Crompton, who, in my absence, performed the operation through the upper third of the thigh, on September 8th. The stump healed favourably, and the patient's general health improved considerably during his stay in the Hospital. He was discharged October 16th.

Dissection of the tumour.—On section this presented all the appearances and characters of an encephaloid cancer. It completely surrounded the lower end of the femur, but did not seem to originate in it, for the compact tissue was entire with the exception of the posterior part of the inner condyle where the disease had denuded the bone of its periosteum and encroached on its structure. In this situation the structure of the tumour was very soft and of a dark brown colour, from effused blood. The ligamentum mucosum, with the fatty tissue of the joint, were soft, thick, and dark-coloured, and one semilunar cartilage had partially undergone ulcerative absorption. The tumour itself had a mottled appearance; it was lobulated, and contained defined masses of brain-like matter, between which slight deposits of blood could be perceived, giving it in places a pink appearance. The portion of the femur that was deprived of its periosteum, presented a porous appearance, with deposits of osseous matter on its surface. The cancellous structure of the condyles was denser than natural from a deposit of yellow matter in its interspaces, between which it had a dirty livid tint. This deposit extended also for some distance along the medullary canal of the shaft.

I visited this patient at his home November 2nd. He looked pale and ill, and had suffered, I found, from diarrhœa. The stump discharged matter from a small opening opposite the end of the bone, and around this there was evident enlargement extending a few inches up the shaft.

I saw him several times during December; he became gradually weaker, and his respiration especially became affected, having all the conditions of the last stage of consumption. During this time the stump gradually enlarged so as to have the appearance of being encircled by a tumour from below the trochanters.

He died on the 18th of January.

Dissection forty-eight hours after death.

Body emaciated to the last degree. Two tegumentary moles of a deep brownish black colour were situated on the left side of the chest.

Thorax.—The lungs were everywhere studded with deposits of encephaloid cancer. These varied in size from the dimensions of an orange to those of a pea. Some were on the surface immediately beneath the pleura, whilst others were located deeper in the lung structure. Several of the larger ones presented a well-marked mingling of melanotic colouring in their section.

There were no other deposits of cancer discovered.

On dissecting the stump the bone was seen to be encircled by a large encephaloid growth. This appeared to have originated in the muscular interspaces and to have pressed on the bone, as the periosteum was destroyed wherever the tumour came closely in contact with the shaft. The bone itself, both within and without, appeared unaffected, save by this contact. Three tumours, apparently enlarged glands, situated beneath Poupart's ligament, presented, on section, the appearances of encephaloid cancer.

In addition to points illustrating the early pain, the size of tumour, and especially the mode of increase by which the circulation through the popliteal vessels became affected, the case of C. M. R. displays the manner of return of this form of cancer after amputation, namely, around the bone in the face of the stump, external to the periosteum, and not in the structure of the bone itself.

Fibro-cellular tumours distinguish themselves by their occurring only at or after the adult period of life—by their almost painless growth in subjects possessed of good general health. Further, in their increase they do not affect the constitution nor lead to enlargement of the neighbouring glands; and whilst advancing slowly, compared with cancerous formations, and attaining a great size, they manifest little or no tendency to soften and decay. If removed by operation they do not recur.

A very remarkable instance of this form of tumour is exhibited in the following case.

R. S., *æt.* 50, a labourer, a spare but healthy-looking man, was sent to me, June 13th, 1856, by Dr. FRASER, of Wolverhampton, on account of a large tumour in connexion with the right thigh.

History.—Noticed a small swelling eight or ten years previously, about the hamstring tendons on the inner side of the right thigh. He knew of no cause to account for this, and as it gave him neither pain nor inconvenience he took no notice of it. It grew slowly until the last twelve months. Then its increase became more marked, and hindered greatly the movements of the knee-joint. The tumour was never interfered with in any way, and he was at last compelled to seek surgical assistance, because he could no longer gain his living from the great size of the swelling. His family history was satisfactory.

Present condition.—The tumour is placed on inner side of the right thigh. It is perfectly oval in shape, and extends from over the head of the tibia and inner side of the patella to within from three to four inches of the origin of the adductor muscles from the pelvis. Its long axis measures eighteen inches, and its circumference, including lower third of the thigh, thirty-six. The skin covering it is dusky, thickened, and adherent on the inferior side where it has been exposed to friction from daily work, but, superiorly, it has undergone little change. There can hardly be said to be any lividity anywhere, and only a few very insignificant veins on its surface. The veins of the leg below are, however, large and varicose. To the touch it feels tense and elastic, not fluctuating, and on firmly grasping the mass an indistinct feeling is conveyed of movement away from the bone. It is entirely devoid of pain, and the glands in the groin are unaffected.

Having punctured the swelling with a large grooved needle, I at first obtained only a little blood, but subsequently, by pressure, succeeded in extracting a viscid fluid of dark colour, which, on examination by the microscope, pointed to the belief, apart from the history and physical characters, that the case was one of fibro-cellular tumour.

Excision, on account of the great size and relations of the tumour, being out of the question, I recommended amputation, which the patient willingly assented to.

June 25.—The limb having been raised for twelve hours previously, to empty the engorged veins, I removed the disease by amputating the thigh through the trochanters. A long flap, obtained by transfixion, from the outer and anterior aspect of the thigh enabling me to compensate for the very short one that was left behind, and on the inner side, from the encroachments of the tumour.

The loss of arterial blood was considerable, and the patient only rallied with difficulty from the first shock of the operation to die from its prolonged effects on the third day afterwards.

Dissection.—The whole of the internal organs were natural.

Examination of the tumour.—The skin adhered firmly to it in some places, in others it was easily separable, and displayed its immediate covering, composed of a thin capsule of condensed cellular tissue. The growth made its way amongst the soft parts which were pushed on one side and stretched around it. Deeper, and for some inches, it lay close to the periosteum, and in places had become attached to it. On section it presented an uniform appearance of a marked cellular character. A viscid fluid, generally of a dark greenish colour, escaped on section, and could readily be squeezed out by pressure. The tumour was not lobed, but strong intersecting bands of fibro-cellular and fibrous tissue passed across it everywhere. In places these were denser and far stronger than in others, and here and there were cartilaginous and even ossific changes going forward. The knee-joint, on being opened, had a perfectly healthy appearance, and there was no change in the structure of the bone.

The fibro-plastic may be readily confounded with the encephaloid intermuscular tumours, more especially in certain stages of their development.

Usually, they may be distinguished in the following manner, so far as it is possible to do so before they are removed.

1. They generally originate in contact with fascia rather than bone. From the fascia they extend either inwards between the muscles or outwards into the subcutaneous cellular tissue and skin.

2. Ordinarily, if these growths be removed, their return at first is in the cicatrix. After repeated removals they may be reproduced in other parts of the body; and after every recurrence, they tend more and more to a closer resemblance to encephaloid cancer. In some cases they do not return after removal.

In all cases excision, where practicable, should at once be performed; and, where amputation is necessary, this may be carried out in the continuity of a limb.

The two following cases, though in many aspects closely resembling cancer, are, I think, clearly specimens of the fibro-plastic tumour. The extent and connexions of the growth in the case of T. F. precluded all idea of operation when I first saw him, and in that of B. C. the situation of the tumour prevented interference.

J. F., *æt.* 50, married, a miserable object in appearance, a blacksmith by occupation, was admitted under my care in the General Hospital March 9th, 1856, with a tumour occupying the right side of the neck. I encountered him, by chance, in the streets of Birmingham, where he was wandering, half naked and starved, after a weary journey, and sent him to the Hospital.

Present condition.—The right side of the neck is occupied by a large tumour, stretching forwards as far as the edge of the left sterno-mastoid muscle, backwards as far as the spine, upwards along the ramus of the lower jaw and ear, and downwards to within a short distance of the shoulder, and overhanging the sternal half of the clavicle. The integuments over it are reddened and tense, numerous tortuous veins traversing its surface. It measures, from the most depending point of the ear to the clavicle, eleven inches; from the same point to the left sterno-mastoid muscle, sixteen inches. It is firm and elastic to the touch, and slightly moveable; there is no sense of fluctuation about it, and it is painful only from its encroachments on the cervical textures, and its tendency to push the head to the opposite side. Plate viii.

There are no glands enlarged in its vicinity, nor are there any other swellings or discolorations about the body.

History.—The patient states that he first observed a small swelling upon the right side of his neck, about twelve months since, which appeared after a violent straining effort whilst at work. For nine months it grew slowly and gradually, but during the last three it has rapidly increased.

His health has always been good, and he has been enabled to work until the last few months, during which time he has undergone great hardships. His children, eight in number, died young. No member of his family, to his knowledge, ever suffered from tumours of any kind.

March 19th.—I punctured the growth with a grooved needle. No fluid escaped, save a few drops of blood.

22nd.—There is rapid increase in the tumour. The integuments above the right nipple are swollen and œdematous from obstructed venous circulation.

April 2nd.—A vast slough has formed over the anterior aspect of the disease, near the seat of puncture.

April 9th.—The slough having discharged itself by poultices, a black fungous growth occupies its place. Bleeding from the fungus to the extent of a pint, arrested by styptic applications.

The bleedings recurred daily until his death, which took place on the 19th of April.

Dissection twenty-four hours after death.

Body exsanguine in appearance.

What remained of the tumour presented a vast sloughy mass of broken-up material. Deeper, some clean sections were obtainable which presented the appearances of encephaloid cancer. None of the natural textures of the neck, on the side occupied by the disease, were to be discovered. The adjacent bones were not involved. There were no enlarged glands to be observed either within or without the thorax. The contents of the cranium, thorax, and abdomen were in a healthy condition, and presented no trace whatever of secondary deposit. Every organ evidenced the drain of blood which had taken place during life.

B. C., *æt.* 62, a bricklayer, married, a strongly-built man, was admitted under my care in the General Hospital, Birmingham, December 12th, 1856, on account of a swelling in the right thigh.

History.—He states that until about three months since he always enjoyed good health, when he perceived an enlargement of the upper part of the right thigh, in the middle line, about the size of a marble. He knew of no cause for the appearance of this, not having injured himself in any way. It gave him no pain until a month since, when it began to increase somewhat rapidly. His habits are temperate, and there is no history of malignant disease in his family.

Present state.—About half an inch below Poupart's ligament, in the middle line, is situated a swelling of the size and shape of a hen's egg. It is moveable along with the deeper parts. The skin covering it is unaltered; it is without pain on examination, and no impulse is conveyed to it by coughing. A sense of elasticity is conveyed to the fingers on manipulation.

December 27th. I punctured the tumour with a grooved needle and gave exit to a small quantity of yellow serous fluid, and subsequently to blood. It has grown rapidly since admission, and has contracted firmer connexions to the deeper parts.

January 14th, 1857. The tumour has increased greatly in size, but is yet without inflammation on the surface. A sense of fluctuation being perceptible in its most prominent part I punctured it with a scalpel and gave exit to about two ounces of yellowish fluid, and again to blood of a dark, veinous character, and to the extent of four ounces. From this time the disease became more tense, harder, and more painful on pressure than previously. Its growth for some weeks was very rapid, but unattended by pain; for awhile it was quiescent and then renewed its advance, so that on March the 4th the circulation in the extremity became affected, and œdema of the entire limb was present. The circumference of the right thigh, over the tumour, is now rather more than twenty-five inches; over the corresponding part of the left rather more than seventeen inches.

May 3rd. Since the last note the circumference of the diseased limb has increased nearly seven inches. About the centre of the tumour, where it was punctured, is a livid, purplish prominence, about the size of a pigeon's egg, from which oozes a little bloody fluid. The patient's face looks worn and suffering, and he has generally lost flesh.

23rd. The tumour now fills the entire groin, obscuring the genital organs, and stretching upwards above Poupart's ligament. A vast black slough occupies the situation of the prominence referred to.

June 6th. The slough has thrown off large portions of the disease, so that its dimensions are much less and fresh portions continue to slough daily.

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The sloughing process continued as long as the patient's strength permitted, but this failing he sank exhausted by discharge and stench on the 13th of June.

Dissection twenty-four hours after death.

The face and general surface of the body was waxy in appearance and anasarcous.

Cranium. The brain was natural.

Thorax. The lungs were scantily filled with blood. There were several old adhesions of the superior and inferior extremities of each. Their structure natural. The external pericardium was lined with fat, as was also the surface of the heart. The valves of the heart were natural.

The glands of the thorax were unaffected.

Abdomen. The mesenteric folds were covered by fat.

The liver, spleen, and pancreas were natural. The kidneys were pale and bloodless. The left one, small and lobulated, contained in the pelvis six calculi of the size of peas. The right supra renal capsule was occupied by a mass of ulcerated material, which had the appearance of broken down encephaloid cancer.

The glands of the abdomen were unaffected.

The diseased limb. The integument being dissected off, the soft parts of the thigh were found to be adherent to the upper and anterior part of the tumour. The leg was now removed at the hip joint, and the femur sawn through above the condyles, where the section of the bone was quite healthy.

On examination it was seen that the tumour was confined to the upper and anterior parts of the thigh, not extending above POUPART's ligament. The rectus and sartorious muscles were in a sloughy state. From this condition being general the limits of the disease could not be accurately defined. The femur immediately beneath was devoid of periosteum from the extension of the process of destruction but the shaft was natural. The femoral vessels, closely surrounded for several inches, passed otherwise uninjured through the centre of the disorganized tissues.

CHAPTER XIII.

ENCEPHALOID DISEASE OF THE LONG BONES.

TRUE encephaloid cancer presents itself in a long bone, essentially in the form of an infiltration of its structure.

It is very constantly a primary disease, being deposited in the midst of the osseous tissue, whether compact or spongy. In my experience it has been most common between the ages of eighteen and thirty years; I have more rarely met with it after forty. Its favourite localities have been the upper end of the tibia, and the middle and lower portions of the femur especially the condyles, next the head of the humerus, followed in the remaining long bones without preference.

In the previous chapter I have endeavoured to show that cancer does not usually act on bone from without, other than as a non-malignant tumour would, by pressing on it and leading to absorption. Bones, nevertheless, sometimes have their structure infiltrated as a result of the progress of a contiguous tumour, and they are frequently the seats of secondary deposits after the removal of external cancers.

The following case of S. H. is a well-marked instance of the infiltration of cancellous structure of the humerus following on the presence of an encircling cancer, the origin of which, I cannot doubt, was outside the periosteum.

The case also affords an illustration of hereditary influence. The young man, S. H., dying of encephaloid cancer of the humerus, and his mother of scirrhus of the breast.

S. H., a thin delicate youth, *æt.* 18, by occupation a sawyer, was admitted under my care in the General Hospital, November 24th, 1857, with a large tumour of the left upper arm.

History.—About six months since he met with an accident by falling from a pony, and bruised his shoulder. He did not perceive any ill effects from the accident until three months afterwards, when he began to suffer pains of an acute and lancinating character in the region of the joint. After this, the arm began to swell and the pain became greatly increased. The swelling was punctured at this time by his surgeon, but only a little blood escaped. Subsequently a fungoid protrusion took place at the seat of puncture, and he began to lose flesh and strength rapidly. There is no tendency to hereditary disease to be traced in the family.

Present appearance.—The left upper arm is occupied by an immense tumour. This extends from the outer third of the clavicle and from the external margin of the acromion in front and behind downwards as far as within two inches of the bend of the elbow. In this extent the humerus is completely encircled by the growth—the axilla is filled by it—so that the tumour rests against the wall of the thorax a little to the outer side of the nipple. The main prominence of the disease is situated more in front of the arm than at the back. The shoulder is yet moveable, and the tumour has evidently no further attachment to it than what belongs to the muscles stretched over it in connexion with either the scapula or thorax and the humerus.

On the inner side of the tumour the integuments have given way, so that a ragged opening discharges an abundant foul material; in another spot, removed more to the outside, a fungous projection

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S. Morelon Del.

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has established itself. Everywhere the integuments have lost their natural character, being thickened and œdematous, and pressed upwards into ridges filled with serum. (Plate iii.)

The circumference of the tumour at its widest point measures twenty-four inches.

The hand and arm are œdematous and partially deprived of sensation. The tumour itself occasions but little pain or inconvenience save from its bulk and offensiveness.

In consultation, amputation at the shoulder-joint was considered impracticable.

In one month after the admission of this patient the circumference had increased to twenty-nine inches. In addition, a large fungous growth, some inches in height, had extended itself from the original seat of puncture.

Exhausted by sloughing and discharge he died January 6th, 1858.

Dissection twenty-four hours after death.

Body greatly emaciated.

Cranium.—The brain was natural.

Thorax.—The lungs were free from adhesions. There was no effusion into the pleural cavities. The base of the right lung for a space of about two inches was broken up by purulent infiltration. The middle lobe of the same lung was sprinkled by several small nodules of cancerous deposit beneath the pleural membrane.

Abdomen.—The viscera were natural. There were no traces of cancerous deposit in any of the textures contained in the cavity.

The tumour.—The integuments were carefully dissected off the entire mass so as to enable me to remove the humerus together with the disease surrounding it. But few of the muscles could be recognized, so altered were they by the encroachments of the growth. In front, the upper fibres of the biceps and coraco-brachialis were still to be traced expanded over its surface. In like manner were the fibres of the triceps behind; not so, however, with the pectoralis major and latissimus and the small muscles about the head of the bone—these were altogether lost. A section was made through the tumour and through the head and shaft of the humerus. The view of the disease thus obtained exhibited a uniform mass of encephaloid cancer, encircling the upper two-thirds of the shaft and the head of the bone. The portions of the tumour in front were almost altogether of a brain-like appearance, here and there interspersed with infiltrations of blood; but behind, owing to pressure, this character was not so marked, the cancer structure being more softened and more generally infiltrated by blood. Notwithstanding that the head of the bone was completely surrounded by the disease, yet the articulation was unaffected beyond the effusion of a little blood into its interior, the cartilages and synovial membrane were natural, but externally the fibrous capsule was lost in the adjacent tumour.

The section of the bone exposed the medullary canal. The cancelli in the shaft were filled by a dirty, purulent-looking material. Nearer the head this deposit gradually changed, until in the head itself it assumed the appearance of cancerous matter of the same brain-like character as was present externally. The outer wall of the bone behind was below closely applied to the tumour, but above it had separated from it and had assumed a roughened, somewhat denticulated, edge as far back as the cartilage covering the head, which was slightly loosened from its attachment to the bone beneath. In front it presented in places a very irregular growth of new bone, projecting outwards for half an inch and extending upwards as far as the head. The walls of the bone had not given inwards, in the least degree, so that the line of separation between the compact tissue and the cancellous was maintained. There was no vestige of periosteum remaining in the upper two-thirds of the shaft, but below, when traced, it was lost on the projecting growth. (Plate iv.)

In reference to his family, a circumstance deserving of particular record came to my knowledge after his death. On July 11th, 1859, Mr. Buxton, of Fazeley, sent S. H.'s mother to me, a strong-looking woman, *æt.* 55, having an enlargement of the left mamma. On examination, I found it to be the seat of a scirrhus cancer, and with it was a hardened gland, as large as a pigeon's egg, in the axilla of the same side. She tells me that she has noticed the state of her breast for about two years, and that of the axilla only six weeks. She has pains of a lancinating character, and is anxious to undergo an operation. She is the mother of thirteen children, five of whom are living—the rest, with the exception of H. S. and a daughter, who died after a miscarriage, not having survived infancy. Her mother died at forty-seven, and her father at twenty-seven, of consumption. None of her family have had cancer to her knowledge; but there is a decided tendency about them to consumption.

I advised that she should leave the disease alone; and subsequently I learned that she died May 5th, 1860.

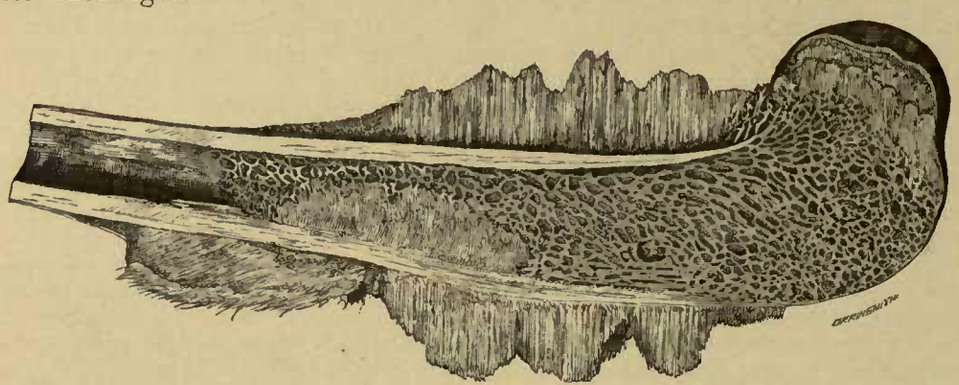
The cancer I am about to describe grows mainly in two different ways, the consideration of which is of great importance to the surgeon.

In the one, the structures of the bone invaded by the cancer are gradually merged in the accidental tissue which takes their place and finally disappear altogether; or, delicate bony processes, remains of the old bone, or a new formation springing from the periosteum, permeate the tumour in all directions, forming a kind of network for the support of the soft encephaloid substance. It is this form that one finds chiefly in the shafts of bones, and which by its extension along the medullary canal, renders the limitation of its ravages to any one part of the affected bone impossible.

In the other the bone becomes expanded as a thin shell, giving way before the growth of the tumour little by little until it forms only a mere friable skeleton on its outside. The articular extremities of the bones are more generally the seats of this mode of development, the shafts above being less certainly invaded by the disease than in the first described variety. Whether the primary cancer originates in the compact tissue of any given bone, is a question difficult to determine in practice, and one that has no bearing on the treatment. The tendency of such a cancer in its increase would still rather be towards the medullary canal than towards the periosteum, and were this not so it would be as difficult to say where the compact tissue ceased to be affected, as I have stated it to be in reference to the spongy.

From the foregoing description of a difference in the mode of growth of cancer arising internally in bone, no features dissimilar as to malignancy can be drawn. It is not so, however, in regard to cancerous tumours springing from the external surface of the compact walls of bones. Here, covered by the periosteum, the growth is applied rather than otherwise connected with the outer surface of the bone. Vertical and oblique plates, "osseous stalactites," arrange themselves more or less compactly in the shape of a tumour, which may completely surround the part or affect only one side. Between these laminæ of bone deposits of cancer take place, filling in the intervals between them, constituting the soft portions of the swelling, and being easily separable by maceration. In the deeper parts of this kind of tumour the bone is often condensed and ivory-like, the compact wall itself also becomes so, and prolongations of the same dense material may be observed in the contiguous medullary canal (see *Fig.* 14), but the interior of the bone seems otherwise unchanged.

Fig. 14.



These essentially differ from the infiltrating cancer in the extent of their malignancy, for the whole of the bone is not affected by their presence, and their return after amputation is happily remote and uncertain. On the other hand, in their recurrence, or if left to themselves, they give rise to the same train of events that ends in cancerous cachexia.

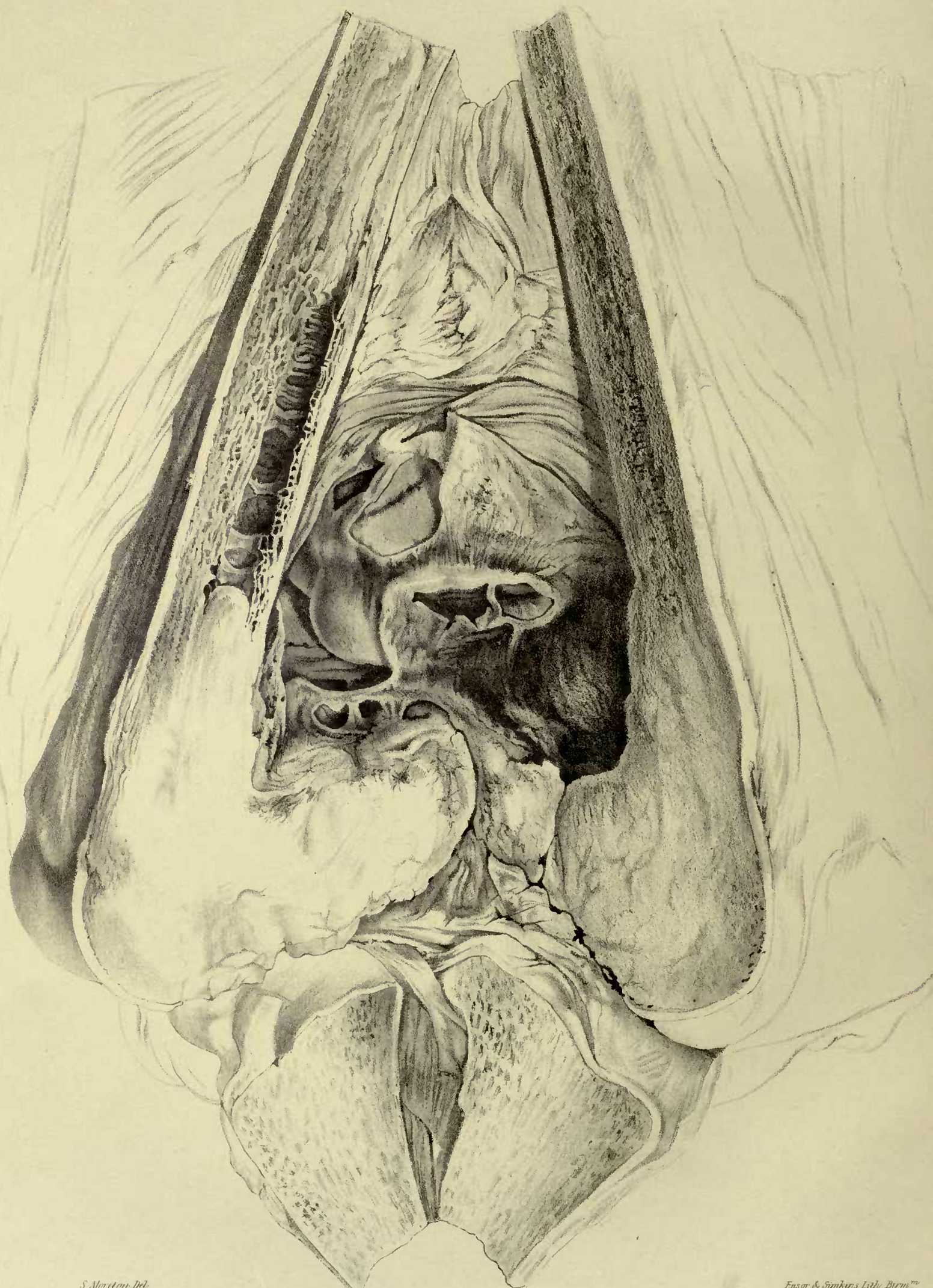
A very early interference with a case of this kind has hitherto been attended by a most satisfactory result.

M. K., *æt.* 18, a spare, delicate-looking servant girl, was admitted under my care July 11th, 1856, on account of an enlargement of the right knee.

History.—Three months previously she fell and bruised her knee, since which time the part has gradually enlarged and been painful. Her father died at twenty-four, of consumption; her mother of dropsy, at twenty-two. There is no history of cancer in her family,

Present condition.—The lower extremity of the right femur is occupied by an oval swelling that extends upwards for a distance of six inches. It is generally firm, in places semi-elastic, covered by smooth non-adherent integuments, and is traversed by numerous enlarged veins. The growth occupies chiefly the anterior surface of the bone with which it appears inseparably connected. The knee-joint is not affected beyond the hindrance to its movements that the close vicinity of the tumour occasions. She has pain on firm handling, and very constantly a feeling of deep-seated pain, especially at night. The inguinal glands are unaffected.

Finding the disease increasing, and her general health suffering from the pain, I amputated her



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thigh, just below the trochanter, September 23rd. She made a good recovery and resumed her occupation as a servant.

Examination of the tumour.—A section having been made so as to expose the centre of the medullary canal, the disease was seen to occupy its interior at a spot distant about three inches from the condyles, whilst externally it completely surrounded the shaft for a space above and below this point of between six and seven inches. The lines of the compact walls of the bone were clearly defined, save where the deposit was placed in the cancelli. Here the wall was somewhat pushed out, and its structure condensed. *Fig.* 14.

The base of the tumour, both within the medullary canal and in contact with the outer walls of the femur, was of a solid character, composed of minute bony plates, arranged in an exceedingly regular manner—closely compressed at first, and as the surface was approached widening, and containing soft material between them, having all the appearances of encephaloid cancer.

The knee-joint was unaffected.

December, 1866.—I have seen this patient recently, ten years having elapsed since the operation. She is well, and gaining her living as a servant.

In some instances the deposit of encephaloid cancer is accompanied by the presence of one or more cysts, filled by a serous or gelatinous fluid, sometimes bloody and at other times of various colours. A favourite locality for this complication is the popliteal space of the thigh, where the cyst is superadded to the primary deposit of the cancer in the structure of the condyles.

When these cysts are large they may very much embarrass the diagnosis, as they often overshadow, from their rapid growth and great size, the original disease.

A very beautiful illustration of this mixture of cancer and cyst will be afforded by a reference to Plate i.

Symptoms.—These are at first vague and ill-defined. Very frequently, after a slight injury, such as a fall or a blow, acute but inconstant pains are experienced in the part. These pains are explained away as a neuralgic or rheumatic, and it is not until a distinct enlargement becomes evident that any mode of inquiry can guide to the true nature of the impending malady.

The character of the pains will vary according as the disease may be placed, closely confined and surrounded, or admitting of free expansion in its growth. In the one case, by rapid progress, they speedily assume the nature of those peculiar to deep-seated cancer. They become intense, sometimes dull-aching and continuous; at others, occurring at irregular intervals and giving a sensation of sharp-cutting instruments running through the swelling. In the other, the origin and even the progress of the malady may be wholly without pain.

In its very early stage it forms a mere projection on the surface of the bone. In all cases it is immoveable, and generally deeply seated. It is unaltered by compression, and without pain on handling, except where the affected bone is thinly covered. The integuments over the tumour are for a long time unchanged; muscles and aponeurotic layers move freely over its surface, retaining their texture and functions.

The encephaloid tumour in bone may increase rapidly or slowly. Usually it develops itself alarmingly fast. Its outer volume, however, may be no real guide to a knowledge of the extent of its ravages, as it may spread along the medullary canal and fill in the wide spaces of the epiphyses of bones for a considerable time before it breaks through and changes the soft parts.

When the compact wall of the bone has yielded, the tumour now covered by the periosteum pushes its way amongst the muscles towards the surface. After a time the periosteum gives way, and then the muscles, and with them all other soft textures save cartilage, undergo absorption and infiltration as the cancer advances. Finally, the growth becomes more and more prominent in outline, and subcutaneous.

In some instances, and especially in the soft, quick-growing cancers of bone, when the tumour comes within reach of the surface there is present the same marvellous sense of semi-fluctuation to which I have drawn attention in the previous chapter. This was clearly illustrated in the case of M. J. R. that I shall presently narrate.

The ordinary shape presented by these tumours is rounded and irregular, usually smooth,

and they often attain a great size before the skin covering them bursts. If the base of one of these growths be grasped firmly by the hands, it conveys a remarkable sensation of fixedness and solidity, in this respect contrasting with the tumours that have their origin near to bones.

As the disease matures the general health becomes affected; with the successive changes in the parts the neighbouring glands enlarge; the pains often become intolerable, and the patient succumbs to the effects of exhaustion produced by bleeding and sloughing or by the effects of secondary deposits in other parts of the body.

The escape of cartilage from implication in cancer of the articular extremities of the long bones is truly remarkable. The whole epiphysis is often destroyed by the advance of the disease, whilst the investing cartilages of the joint are unaffected. The cartilages may be partly eroded and thinned by the effects of the pressure of a growing cancerous tumour, but otherwise they are unaltered.

Notwithstanding this immunity, a soft quick-growing cancer, such as we are describing, will from time to time penetrate the interior of a joint and give rise to collections of blood and other changes due solely to the mechanical inconvenience which its presence occasions.

This is generally effected by a lateral escape of the cancer growing from within the epiphysis, the wall of bone having disappeared, as well as the periosteum, the adjacent synovial membrane offers the least resistance to its further progress; it at length yields, and the cancer intrudes itself within the joint, overlying the incrusting cartilage. *Fig.* 15.

The following case exhibits, in a well-marked degree, the prominent features of the rapidly-developing cancer in bone, and affords reasonable ground for anxiety in reference to the chances of its recurrence.

M. J. R., *æt.* 19, unmarried, a delicate-looking girl, employed in a needle factory at Redditch, was admitted under my care in the Hospital July 12th, 1866, on account of a swelling at the upper part of the left leg.

History.—Two months since she was delivered at the full period of a living child. Some few months previously during her pregnancy she fell, bruising the left knee. About a week after her fall the upper part of the tibia became the seat of dull aching pains. These were by no means constant, but they were never absent long together. A month before her admission she noticed an enlargement at the seat of injury and pain.

She has generally had good health, and there is no history of cancer in her family.

Present condition.—The left tibia just below the tuberosities presents a swelling as large as a small orange. It is irregular in shape, smooth, with the margins gradually becoming lost in the soft parts. It is firmly elastic to the touch, and a little painful on deep pressure. The skin covering and around it is entirely unaltered, appearing simply lifted up by the growth beneath. In the tibia itself there is no change in shape below the position of the swelling, but from the complete immobility of this apart from the bone, it is evident that it is intimately connected with its structure. The movements of the knee-joint are not affected. There are no enlarged glands.

Having dried up the mammary secretion and improved the general health by good nourishment and quinine, a close observation of the swelling for nearly two weeks led me to be satisfied in giving a confident opinion at this early stage that the disease was encephaloid cancer, growing, most probably, from the cancellous interior of the bone. I was the more decided in this on finding that the swelling markedly increased, that with this the pain rather diminished, and that the integuments remained unchanged.

Having laid this judgment before the patient I advised that the nature of the swelling should be explored. There was a slender chance that it might be abscess within the bone—otherwise it was cancer, and amputation through the thigh was the only treatment.

The patient, however, would only permit me to examine the tumour.

Accordingly, on July 25th, under chloroform, I laid bare the expanded tibial aponeurosis by a crucial incision in the centre of the tumour. The surface exposed looked perfectly healthy, and conveyed to the fingers the most decided impression that there was fluid beneath. A trochar was now plunged in, and blood only escaped. I now divided the aponeurosis corresponding to the external wound, and opening into the disease yet covered by some light cellular tissue, obtained a section which exhibited the characters of encephaloid cancer.

After this the tumour speedily increased, and at the seat of puncture a gradual protrusion of the cancer occurred.

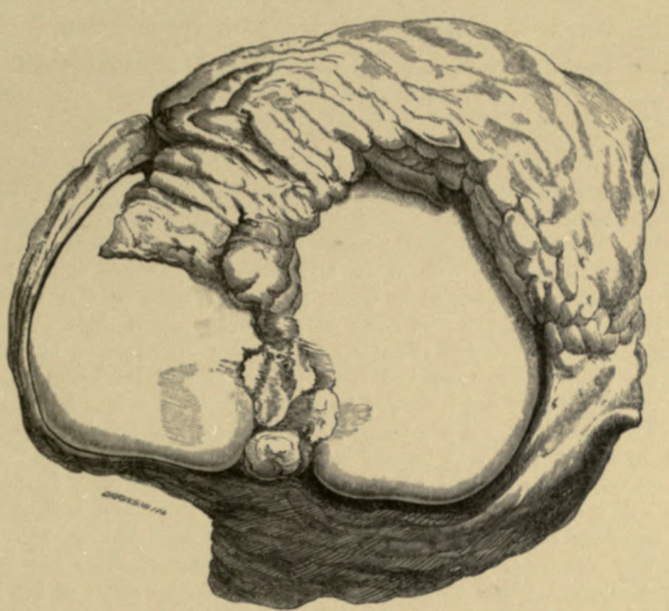
Her general health becoming affected she consented to amputation, which I performed on August 8th, removing the disease by cutting through the thigh in its lower third, and covering the stump by rectangular-shaped flaps.

Dissection of the disease.—On opening the knee-joint the cancer was seen to have spread within the

capsule, having perforated laterally the periosteal covering of the tibia, close to its investing cartilage, and finally the synovial membrane itself. See *Fig.* 15. Resting on the edge of the cartilage it bordered and overlapped the head of the tibia on its inner side. In front, it penetrated to the spine, and thence spread somewhat over the external half of the head. By this intrusion the semilunar cartilages were pushed on one side and the cavity of the joint distended; but neither were they nor the investing cartilages otherwise affected.

On section through the head and shaft of the tibia the cancellous tissue and medullary canal were seen to be filled by encephaloid cancer, reaching downwards for a distance of nearly four inches. The compact tissue of the bone forming the whole of the internal wall, together with the projections of the tuberosities, had disappeared before the advance of the disease.

Fig. 15.



After the operation the patient's general health improved; and, though the stump healed slowly, its general condition was never otherwise than promising.

September 24th.—There is still a little discharge from the stump. Observed a decided thickening about the end of the bone, which extends upwards for about three inches and is slightly painful on pressure. The inguinal glands are not affected.

October 19th.—The thickening about the bone remains evident. All discharge has ceased. The patient's general health is good. She left the Hospital this day to return home.

December 20th.—I have very recently seen this patient. Her general health is good. The thickening at the sawn extremity of the bone diminished. No affection of the glands.

Diagnosis.—In the first instance the character of the pains may be confounded with those arising from rheumatic or periosteal inflammations.

It should be borne in mind that rheumatic pains are inconstant, ceasing sometimes for months, whilst cancer pains in bone, when once developed, never completely disappear. Periosteal pains are aggravated by the heat of the bed, and yield, when specific, to the influence of medicine. On the other hand, the pain of cancer in bone is unaffected by temperature and unchanged, permanently, by any known remedy.

The encephaloid cancer of bone may also be mistaken for exostosis; and, when situated in the condyles of the femur, for simple disease of the knee; and, lastly, it is not unlikely to be confounded with osteoid cancer. There are also many appearances connected with the formation and progress of abscess within bone that may, without careful study of the history of the case, lead to error as to the true nature of that disease.

Exostosis is distinguished by its painless and slow growth; by its often being multiple and symmetrical; by its not affecting the general health; and by its not recurring after excision. The

skin covering a simple exostosis is very thin and closely applied to the solid bony substance growing outwards.

Disease of the synovial membrane of the knee leading to uniform swelling and enlargement may well simulate an encephaloid growth in the end of the femur or head of the tibia in an early stage, but the history of the simple disease—its origin from constitutional causes or from direct injury, and, above all, its progress, suffice, with ordinary care, to determine the true nature of the malady.

Abscess within bone is ordinarily distinguished by the far longer time occupied in the development of the disease, by the periodical character of the pain, and by the absence of glandular complications.

The case of J. B., which I relate below, is strongly impressed on my mind with regard to the very grave doubts that existed as to the benign or malignant nature of the malady, independent of its history.

J, B., *æt.* 19, by trade a blacksmith, was admitted under my care in the Hospital January 3rd, 1862, on account of a disease in his left knee.

History.—He states that he enjoyed perfect health until about seven years ago. One day as he was running fast up stairs he felt a sharp pain in the knee, on the outer side of the head of the tibia. It went away during the night, but returned at times, lasting for three or four weeks, over a period of several years. During each attack the pain came on periodically about three o'clock in the afternoon. His health, however, remained good, and there was no swelling in the joint; but there was tenderness on pressure about the head of the tibia, and some feeling of stiffness around. The pain was of a gnawing character, worse at night, and increased by standing. Twelve months back the pain increased so much as to be scarcely bearable. He was leeched and blistered, and not improving, was admitted into the Hospital, where, by complete rest, he became better. On resuming his work the pain very speedily recurred; but he kept on despite it, until his health suffering he again came to the Hospital.

Actual condition.—A somewhat delicate-looking young man.. Knee-joint stiff and swollen. Over the head of the tibia—especially on the outer side—there is slight enlargement. This conveys the feeling of being connected with the bone; the soft parts generally, however, about the joint are œdematous, and thickened by the repeated effects of blisters, so that the natural shape of the knee is lost. There is tenderness generally over the altered surface, but decided pain only over the head of the tibia, towards its outer side. The pain, which is worse at night, he describes as being of a deep-seated, gnawing character. Beyond the change in the integuments and the condition of the head of the tibia, there are no symptoms of the interior of the knee-joint being involved. The inguinal glands were unaffected. Complete rest was again carried out for several months, and during this period relief to the pain was chiefly obtained by the repeated use of blisters. At length the malady became aggravated in its great feature—the pain ceased to have any interval, and I could make out what appeared to me a decided increase in the prominence of the bone. He now earnestly besought me to remove his limb. In consultation with my colleagues, having regard to the probabilities of malignant disease, and the necessity of amputation should such turn out to be the nature of the case, I proposed to first trephine the head of the tibia, in the hope of relieving a circumscribed abscess within its interior. Accordingly, June 2nd, 1862, having laid bare the outer side of the head of the tibia by a crucial incision, I applied a small trephine, and after removing a plug of bone three-quarters of an inch in depth was gratified to find a quantity of well-formed pus welling up from within the bone. The abscess was distinctly circumscribed, and lined throughout by a soft, velvety membrane. This proceeding was attended by the happiest results. He lost all pain. The wound healed favourably, and on his discharge, at the end of a month, there was only a little ooze of matter. The knee yet remained very stiff, but he managed to get about by the aid of a stick.

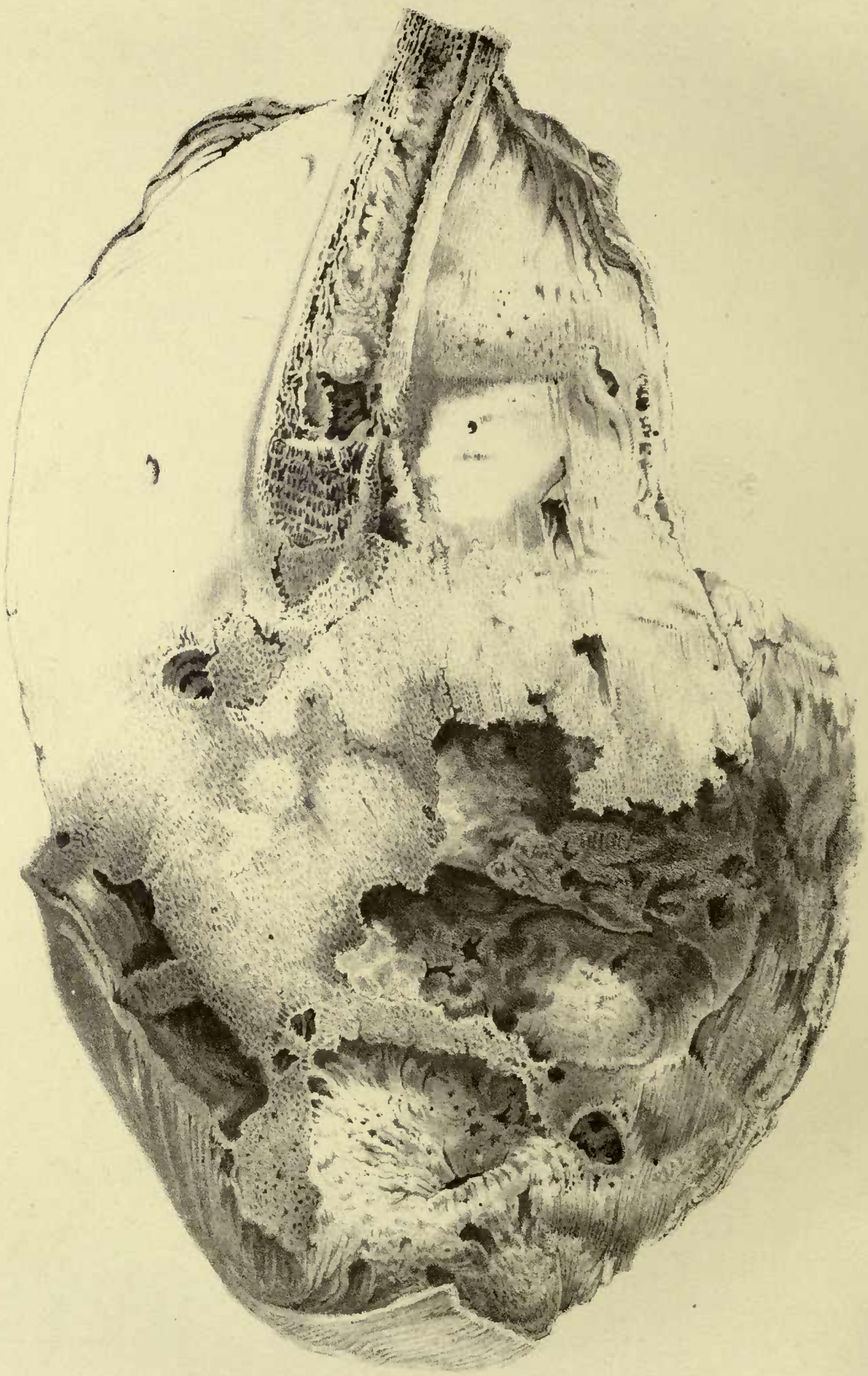
September 15th.—Came as an out-patient. Can walk with facility. No pain whatever in the head of the tibia. The centre of the wound still discharges by a small aperture as large as the end of a probe.

January, 1867.—J. B. has long since been completely restored to health.

OSTEOID CANCER.

Externally, osteoid cancer differs from encephaloid in bone in assuming, when situated in the long bones, an oblong or lengthened oval shape—in growing much slower and feeling much harder. See Plates ii, xi. It usually prevails at a later period of life, between five-and-thirty and five-and-forty rather than earlier. It is comparatively a rare disease; and it fails in any part to present

PLATE II.



S. Norton. Del.

Enser & Simkins, Lith., Birm.m

the feeling of fluctuation which marks the approach to the surface of the softer form. For a very long time the skin covering it remains intact. Where the soft parts between the skin and tumour are thin the external surface conveys, with the sense of incompressible hardness, that of being arranged in a tuberous manner. When it does give way the extension of ulceration is slow and the tumour itself, if left alone, resists the sloughing process, breaking up with extreme difficulty: the surrounding soft parts undergo stretching and disturbance of their position rather than change in structure.

The neighbouring glands in their enlargement partake of the character of the cancer, and form tumours which, on section, present a chalk-like, osseous substance.

Internally, the osteoid tumour will be found composed mainly of bone. This is of a peculiar character, being dense and ivory-like in the centre and near to the shaft, and very abundant, whilst towards the surface it is found more scattered, occurring in separate plates, some ivory-like and others composed of spongy material, the surrounding and chief substance being a very tough fibro-cartilaginous material, entirely unossified, and usually being of a yellowish white colour. The very solid bony portions of these tumours when dried may be more or less powdered by rubbing, and assume a peculiar chalk-like appearance.

In many instances the encephaloid and the osteoid form of cancer present themselves in the same tumour, assuming gradations of softness and hardness accordingly as the brain-like or bone-like material predominates in different parts; and in all respects the osteoid cancer closely follows the degrees of malignancy which I have laid down as belonging to encephaloid cancers generally.

The following case possesses all the characteristics of this form of cancer.

M. W., *æt.* 52, a remarkably well-formed, handsome woman, but looking worn, was admitted into the Hospital in July, 1850, under the care of Mr. Crompton, on account of a large tumour connected with the right thigh.

History.—Is the mother of fourteen children. Seven years ago, during pregnancy, and after a bruise received on the knee from a fall, she observed an enlargement of the inner side of the thigh, commencing just above the condyle. The growth of the tumour was slow, until about sixteen months since, when her general health beginning to fail, she noticed it rapidly increasing. It was some time after this that she discovered some lumps in the groin. The amount of pain has not been excessive, and less so of late. There is no history of cancer in her family.

Present condition.—The tumour lies entirely on the inner side of the thigh. It springs from the lower third of the shaft of the femur and from the inner condyle. It is of large size, measuring nearly twelve inches in its transverse diameter. Except from impeded movement, the knee-joint is unaffected.

To the touch the tumour is hard and immoveable. It is oblong—elongated oval in shape—and with the integument unchanged, except at the apex, where it is reddened and thinned, and traversed by numerous large veins. The growth here is less resisting than elsewhere, yielding an almost elastic feel. In the groin, beneath Poupart's ligament, are three small hard and moveable tumours.

As operative interference was not deemed advisable in the presence of the enlarged glands, she left the Hospital after a stay of only few days.

I followed out the remainder of this patient's case, visiting her at her own home, where she died in the first week of December. Three months before her death the tumour ulcerated, and on giving way bled severely. The progress of destruction of the softer parts was very rapid, but unaccompanied by further hæmorrhage.

I was only permitted by the friends to examine the tumour after her death, which, together with the lower half of the femur, I removed for careful dissection.

The main portion of the tumour (Plate ii) was formed of bone, of close ivory texture and white colour.

The cancelli of the upper portion of the shaft remained distinct in places, only being replaced by lymph. At the lower part the shaft gradually merged into the tissue of the tumour. The lower half of the tumour was excavated by ulceration into a large basin, eight inches in diameter, having a foul sloughy surface.

On the posterior face of the tumour was a fibrous growth, composed of cells, not unlike the spongy vascular tumours of bones, which, by the microscope, manifested a fibrous stroma, with numerous small globular candate and fusiform cells. Knee-joint natural; patella pushed upwards.

The glands in the groin were of very much the same structure, apparently, as the tumour itself, presenting, on section, a solid surface, composed of a chalk-like osseous substance, dull white in colour.

The case of S. L., which I am about to relate, possesses a deep interest. The appearances

of the disease differed somewhat from those observed in M. W., but in general features of resemblance the identity with that of osteoid cancer is, in my judgment, well maintained, in the presence, perhaps, of a lesser degree of malignancy having been reached by the malady when the patient first came under my notice.

Mrs. S. L., *æt.* 37, a healthy-looking married woman, consulted me on November 22nd, 1860, on account of a vast tumour of the left leg.

History.—When about six years of age she ran a needle in the left calf. The needle remained for some months until an abscess formed, when the needle was removed and the wound healed.

When about fifteen years of age, she perceived this leg "to become bowed," as if something was growing to the bone. After a time she noticed a small hard lump, not bigger than a nut. This was placed at the upper and outer part of the calf, and was altogether free from pain and immoveable. The glands in the groin were never enlarged.

But little change occurred in the disease until she began to bear children. From that time it slowly increased in size, and for many years maintained an even rate of progress. Within the last two, however, a more rapid growth became apparent. Up to this time there had been scarcely any pain in it; but latterly she has suffered severely, the pain being at times of deep aching character, and at others darting through the tumour so as to disturb rest. During the last six or twelve months its growth has been more rapid still; and more recently the skin has given way on the outer surface over a space as large as a crown piece. From this spot, already, one or two attacks of bleeding have occurred.

Mrs. L. has had twelve children, nine being born at the full time. On two occasions, twins. Of this family four only are now alive, the rest having died young. She commenced menstruation early, and has been always regular and generally strong and healthy. She has not been unwell for the past two months, and thinks that she may be pregnant. Her body is not thinner, but her colour has become paler, and the face somewhat worn, since the marked increase in the tumour. In her immediate family history her father died of dropsy; and her mother, as she states it, of "a bleeding cancer in the womb." She is one of nine—four boys and three girls—but neither amongst these nor amongst her aunts and uncles is there any evidence of malignant disease.

Alarmed by the condition of the limb, she, for the first time, made up her mind to show it to a surgeon, having hitherto managed, even in her confinements, to conceal it from every one but her husband.

Present condition.—The tumour occupies the outer and posterior aspects of the left leg. Of elongated shape, its most prominent part is immediately below the outer condyle of the femur, from whence it tapers downwards until within a few inches of the external malleolus.

Hard and incompressible, it everywhere conveys the feeling of solidity, and is evidently attached to the fibula for three-fourths of its extent. Except being thinned by stretching, the soft parts appear unchanged, whilst the integuments display but few enlarged veins, and are discoloured, of a slight livid tint, only, where, for a short distance, the sloughing process has commenced. The inner margin of the tibia is distinct; but the outer is lost in the encroachment of the tumour forwards. In its most prominent part it measured thirty-five inches. The movements of the knee-joint are free. There are no glands enlarged.

Five days after the visit to me of this patient, on the 27th November, notwithstanding the possible pregnancy, I amputated the limb in the middle third of the thigh. All serious loss of venous blood was obviated by having the limb elevated for the previous twenty-four hours, whilst the arterial was completely controlled. Nevertheless, the shock was great, and careful watching was required for many hours. Mrs. L. rallied from the effects of operation, and her subsequent progress was unattended by a single bad symptom; the stump being soundly healed in two months.

Examination of tumour.—The parts surrounding were perfectly healthy in appearance, some of the muscles being stretched and thinned by the advance of the disease.

A section through the centre of the growth having been made it was seen to be in connexion with the fibula for the upper three-fourths of its extent (Plate xi), which for that distance was merged in its structures. Outwardly, it was encased by what yet appeared like a stretched periosteal covering, and which had yielded only at the upper and outer parts. The portions of the tumour nearest the position of the fibula were composed entirely of bone, some of it being intensely compact and ivory-like, and other parts of a cancellous structure. More externally, separate plates of bone were met with, the intervals being filled by a very firm dense material, which constituted the chief outer part of the tumour. This unossified part was chiefly of a yellowish white colour; but in places there was a greyish tint, and in one place only a limited vascularity apparently from a blood vessel having recently given way.

January 24th, 1861.—Mrs. L. was delivered of a child at about the sixth month, which only breathed a few times.

December, 1866.—I have seen Mrs. L. this day. She is strong and well. The stump remains sound, and there is, at the end of six years, no evidence of return of the disease.

A record of the preceding case would not be complete if I failed to direct attention to the fact that this patient sustained the shock of so great an operation when between two and three

PLATE XI

S. Morton, Del.

Ensor & Sumkins, Lith. Burm.

months pregnant. The great fatality that attends capital operations when performed on women, whilst pregnant, would have led me to postpone the proceeding in this instance, had I not deemed it better to run this additional risk rather than permit a locally malignant tumour—long existing and now assuming changes—to have a chance of producing constitutional contamination in a delay of succour that must have extended over many months.

Treatment.—The only treatment applicable to these malignant tumours of bones is amputation or disarticulation. Either the one or the other of these means of removing the disease should be resorted to in the earliest possible stage, before either the glands or the constitution have become in any way affected by its presence. Local applications are worse than useless in these cases, and serve only to diminish the chances of the patient's immunity from recurrence of the malady in the future.

As a rule disarticulation should be preferred, on the principle that whenever amputation through a bone in which the disease originated is performed, the patient is exposed to the liability of the disease having been prolonged in the medullary canal above the point of section.

This rule of invariable amputation at the contiguous joint, or through the shaft of the bone immediately above, must naturally be modified under certain circumstances, more especially where the operation in itself, as in the case of removal of the whole lower extremity at the hip, is eminently dangerous to life. But where this consideration is not before the surgeon there ought to be no hesitation as to the line of treatment he should recommend.

Reserving, therefore, the consideration of disarticulation at the hip, the remainder of the subject admits of clear decision. Thus—whenever the disease originates in any part of the tibia or fibula, amputation should be performed at the knee-joint or through the thigh. When in the radius or ulna, at the elbow-joint or through the humerus. When in the humerus, at the shoulder-joint.

Where the situation of the disease in the shaft of the femur, as in the upper third, admits of no alternative, then amputation at the hip should be advised, as affording the patient the only means of treatment. Lower down, in the middle third, the surgeon may amputate through the trochanter and dissect out the head of the bone in preference to the more dangerous wounding of vessels involved when the flaps are cut at the hip.

When, however, the malady is in the lower third of the bone or in the condyles, there will be many reasons to induce the surgeon to amputate through the shaft of the femur, high up, rather than disarticulate.

The foremost of these will ever be the gravity of amputation at the hip, under any circumstances—a gravity rendered more conspicuous in the face of the well-known want of power to bear operations which patients suffering under malignant disease of bone so constantly exhibit.

Further, that although the liability for the cancer to recur at the sawn extremity of the bone is very great, it must also be borne in mind that it by no means always does so; any more, indeed, than that recovery after amputation at the hip establishes any certainty that the patient will escape secondary deposits in the internal organs, rather than one who has also recovered from amputation through the continuity of a limb. I may point with confidence to the case of M. K. to justify the surgeon in giving his patient the benefit of a doubt in this situation, which he would not be warranted in doing in the leg or the arm.

As to the prospects of recovery which operations in these cases afford, my own experience leads me to state that no opinion should be given with confidence.

Left to themselves, destruction of limb and loss of life are inevitable. On the other hand, if the disease is found out and appreciated early and is followed by amputation, its recurrence may be postponed for many years, possibly altogether.

With the knowledge of this fact before us, then, we are warranted in urging patients to give themselves the chance that attends an operation when the general circumstances of the case justify its performance.

CHAPTER XIV.

MELANOTIC CANCER.

MELANOTIC cancer is met with in two forms, either as a primary or as a secondary disease. As a primary disease its most frequent seat is the skin or the eye, and less frequently it is encountered in the subcutaneous cellular tissue.

It has been observed also in its first form in the lower jaw, in the testicle, vagina, and rectum, and it is said likewise to have been seen in the liver.

The appearances ordinarily presented by melanotic cancer, as a primary formation, are—

In the skin.—The production of a small, solitary, deep brown, black, or blackish spot, situated on some part of the skin. Very frequently this spot is located near to a congenital mole or wart, or the congenital marks themselves undergo melanotic degeneration. Thus, in thirty-four cases in which the disease appeared in the skin or subcutaneous tissue, I ascertained that fifteen had developed in or near a congenital mole, wart, or mark.*

The disease may remain quiescent for a considerable period, but sooner or later an increase in its dimensions becomes evident, and the neighbouring glands are contaminated, or its progress may be manifested by the development of numerous secondary deposits of the same black colour in the cellular tissue of the body, or in the viscera.

When a cutaneous wart degenerates, the first indication of a change in its character is perhaps evidenced by the discovery of black streaks running across its free surface, or darkening the margins of the growth, as it rests on the part to which it is attached. These changes are singularly devoid of pain, and indeed effect no apparent alteration in the hitherto harmless growth, beyond that which the eye detects in the colour.

In the eye.—The globe becomes distended by the morbid growth, which first locates itself between the choroid and the retina. In the earlier stage a dark livid colour is presented, and after a time, when the tunics have become absorbed or ruptured by pressure, a fungous mass of the characteristic sooty blackness pushes its way outwards.

The further progress of the disease in this situation is manifested by the discharge of black fluids, and by the breaking-off of masses of the protruding fungus. Rarely do the neighbouring glands become affected, but secondary deposits abound in the subcutaneous cellular tissue.

Unlike the development of cutaneous melanotic cancer, the growth of that of the eye is from first to last accompanied by severe pain. This is, however, owing to the unyielding nature of the parts, and not to any difference between the characteristics of the disease in the skin and the eye.

In rare instances the subcutaneous tissue is the locality where melanotic cancer first displays itself.

* See my Treatise on Melanosis. Churchill, 1858.

It will here appear as an isolated spherical nodule, the black or blueish black colour of which is visible beneath the skin. These solitary nodules may be very numerous, or only a single one may be detected. They may vary in size, from a swan shot to a hazel nut. They are moveable in the early stages of their growth, and by degrees the skin covering them becomes adherent, and at length yields by gradual absorption, and the black tubercle starts outwardly, loses its spherical character, becomes flattened, and finally ulcerates and discharges a peculiar secretion, devoid of smell.

The subcutaneous tissue, or cellular membrane, is, however, as above mentioned, very frequently the seat of the secondary growths of this disease.

As a secondary deposit, melanotic cancer most usually presents itself under three forms.

1.—It is deposited in the substance of an organ in the shape of tubera, either partially encysted or altogether devoid of any trace of such covering. These tubera vary in size from that of the smallest granule to that of a considerable tumour. In colour these are generally intensely black, but sometimes they are composed of a mixture of brain-like cancer with the melanotic, which gives them a variegated appearance. In the cellular membrane, around internal organs, the disease assumes the characters described as belonging to the primary melanotic tubercle of the subcutaneous cellular membrane.

2.—The surfaces of organs appear, as it were, streaked with the deposit running in lines of varying thickness, and always abruptly defined from the adjacent natural colour of the part. At other times it appears as if sprinkled in spots, or laid on in a thin layer: in these instances the colour is always black.

3.—It is found in a liquid state: some of the tubera above described are sometimes partially fluid in their interiors. This condition is owing to the softening and breaking up of their contents, and not to the deposit of the melanotic matter in a fluid form: more frequently the consistence is like that of black paste or cream.

The melanotic matter is very rarely encysted, but it is occasionally surrounded by a pseudo-cyst, formed simply by the condensation of the adjacent cellular membrane. The melanotic tubera, seen in the interior of the liver and other organs, are hardly ever encysted; the masses being deposited in the midst of the natural structure of the part, they can be readily separated from it, even without tearing, and are capable, as it were, of enucleation. This, so-called cyst, of melanosis in masses, is of very slender texture, and has never been observed to be formed of fibrous, cartilaginous, or osseous materials. By the exterior surface it adheres lightly to the parts in which it lies embedded. By its interior it is in contact with the melanotic matter, and it sometimes sends in prolongations, so as to subdivide it into lobules.

The finest injection fails to detect any vessels ramifying in the interior of these masses. Their consistence varies, being sometimes as soft as tallow, and at other times partaking more of the firmness of glandular structure.

In colour, melanosis has many shades. In its primary form on the skin it is almost always brownish, varying perhaps from a yellowish brown to what is known as a bistre-brown. Later, the brown shade assumes every intensity of black. Sometimes, especially in the alterations in warts, the first change is of a slate colour.

In the eye it is at first livid, afterwards of a sooty blackness.

In the internal organs it is seen of a blueish black, or a raven black, rarely brownish, except in the liver. The black colour, too, will stain white paper like Indian ink.

There is hardly any tissue of the body in which, in some one or other of the previously described forms, melanotic cancer has not been found.

The cornea, the articular cartilages, and synovial membranes, tendons, and generally all aponeurotic expansions are, however, exceptions; and to this list of unaffected textures I must add also the tongue, for I am unacquainted with a single instance in which this organ has been found diseased.

In regard to the relative frequency with which the internal organs and the tissues generally have been found affected I have ascertained, after careful research, that the liver and the lungs, the celullar tissue, and the serous membranes are most frequently the seats of deposit. After these the bones and lymphatic glands.*

When the liver is diseased by melanosis it is generally enormously increased in size. The deposits assume the shape of tubera. They are rarely single, the whole organ being generally studded with them of all sizes, from the smallest grains to tumours as large as a hen's egg or even as the fist. They are visible in the midst of the natural liver structure in all directions, perfectly isolated, and most frequently without any appearance whatever of being contained in a cyst. In colour, the masses vary from the deepest black to shades of a less intense colour. Sometimes they assume a brownish tint. The tubera that are near the surface of the organ elevate the peritonæal coat so as to be visible through it, constituting an irregular nodulated aspect throughout.

There never appears to be any general infiltration of the hepatic texture by these masses; it rather yields, as it were, and the diseased material is inserted within. Even its colour does not change to any more considerable extent than to assume a somewhat duskier hue. Sometimes, however, the liver is more tender and lacerable, in situations where these deposits most abound, and where the black matter becomes diffused, the intermediate texture between the tubera obtains a melanotic character, and the entire texture of the organ becomes then to a great extent disorganised.

Melanosis will doubtless attack persons of all ages; but there can be no question that it is a disease of adult, middle-aged, and even advanced life, rather than of childhood, and that it exhibits no predilection for either sex.

Of the causes which may have induced the onset of melanosis we know little or nothing. In by far the majority of instances no known cause can be assigned. In others a blow, especially on the eye, has given a date to the first recollection of the possible commencement. Nor are there any special circumstances in regard to hereditary transmission that in any degree mark this variety of cancer.

I shall now proceed to narrate two cases of melanosis that have come under my own observation.

H. W. J., *æt.* 23, single, a cooper by trade, with dark hair and sallow complexion, was admitted, under my care, in the Hospital, on the 16th of June, 1854, with a coloured warty growth upon the integuments covering the lumbar portion of the spine.

History.—About two years since he discovered by chance the presence of a wart, about the size of his little finger nail, in the hollow of his back, which had, no doubt, been there from birth. It was at that time free from pain; but in the course of a few months, some irritation having been recognised by the friction of his apron strings, it discharged, and became a source of annoying itching.

In the month of November, 1852, he consulted a medical gentleman at Dudley, who removed the growth by the knife—slicing it off on a level with the adjacent skin. Any tendency to reproduction was kept down by the application of caustic; and at the end of six weeks the wound was healed.

Three months after this date it reappeared; and in the month of September, 1853, it had attained the size of a crown piece. Its removal was now accomplished by ligature; the healing process being completed in the space of four weeks.

Two months subsequently it again appeared, its growth being uninterfered with until his coming under my notice.

He tells me that up to the age of twenty-one he always enjoyed good health, when he contracted syphilis, in the shape of a sore on the frænum. He was not under regular treatment for this, but consulted a druggist. His gums were not made sore. From his birth there have been present in various parts of his body, small patches of discolouration of the skin. He is not aware of any tendency to disease in his family.

Upon examination I found a warty-looking structure, situated in the middle line of the back, over the first lumbar spine (Plate ix, *Fig.* 1). It was about two inches in breadth by about the same in length. Its surface was flattened, irregularly warty, of a pink hue generally, but with some slate-coloured portions intermingling themselves in streaks. It was closely adherent to the parts beneath, but its edges were free, and overlapped the sound parts adjacent for half an inch. The aspect of the inferior surface of this free margin was of an inky character. There was no ulceration, but an irritating moisture arising. He had been in the habit of applying a simple cerate on soft linen to prevent friction. Some distance above, I also noticed a small wart as big as a pea, of a brown colour.

* *Op. Cit.*, p. 17.

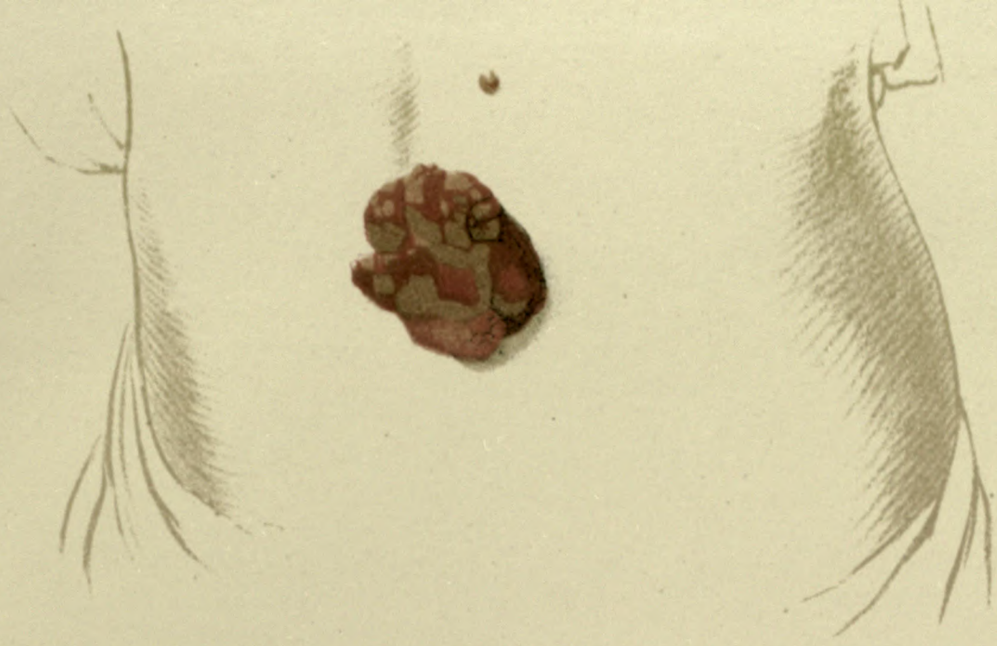


Fig 1

Fig 2

Fig 3

Fig 4

On the 28th of June I excised the disease, cutting off as much integument as was covered by it, together with the fascia from the muscle beneath.

The part healed slowly by granulation, and at the end of six weeks he was discharged. His general health at this period was good, and he had gained flesh since his residence in the hospital; his complexion, however, looked muddy, and was generally dark-coloured.

Three months after his discharge he noticed the appearance of two or three black nodules beneath the skin; one especially, situated on the right leg, attracted his attention, whilst the rest were scattered about in various parts of the trunk and limbs: they were none of them larger than black currants.

In January, 1855, I saw him and examined him. I found a small tubercle, moderately hard, beneath the integument of the leg, over the head of the right tibia. Its dark colour was discernible through the thinned integuments. Near it was a second, smaller in size. There were others similar, in various situations. The cicatrix of the wound was sound. I recommended him to go into the country, and to leave the tumours to take their own course.

In July he saw me again. In the interval some of the tubercles had been stimulated to ulceration under the advice of a quack.

His appearance is now pale and cachectic; he complains of pain in the left side, in the loins, and in the shoulders, and he has lost flesh. His back and sides are covered by a papular syphilitic eruption.

There are six of the tumours which are as large as a shilling piece, and which have been especially the object of treatment: one of these is situated on the inner side of the head of the right tibia, one on the calf of the same leg, one between the thigh and side of the scrotum, one on the thigh, one on the left forearm, and one over the right scapular spine (Plate ix, *Figs.* 2 and 3). These have pressed their growth through the integument; their shape is circular; their surfaces are irregular, ulcerated, and mamillated; their colour blueish, black, or deep brown, and they move freely in the subcutaneous tissue; they give rise to brown-coloured discharge, free from smell, and display no tendency to soften.

The earlier forms of these nodules are felt like peas beneath the skin. In some of these the covering integument is thinned, so as to show the pigment beneath; in others it is unaltered. They are very numerous in the subcutaneous tissue; even the cicatrix of the wound now covers a number of them, firmly seated in the parts beneath; it is, however, sound in itself, but at its upper margin a black streak is visible.

August 16th. By following accurately my directions as to rest, water dressing, and diet, the sores are easier. He, however, emaciates, and gets no sleep at night.

September 3rd. He called on me, and was evidently in more feeble health. The tumours were much about the same, but increasing in number.

September 13th. I received a note requesting me to visit him in the country. I was unable to do so; but in my absence a medical friend saw him for me. He found him paralysed and comatose, with only a few hours to live. He died on the 14th.

The account I was enabled to obtain of his seizure was to the following effect:

On the 12th his friends, on going to him in the morning, found that he had had a fit during the night, and that he had lost the use of his left arm and leg. His speech was unaffected. The evening of this day he was removed a distance of six miles, appearing low, and speaking seldom. On the 13th his respiration became difficult, and accompanied by loud mucous rattles. He was constantly sick, and the vomited fluids were of an intense grass-green colour. These symptoms ushered in death.

I was not able to make the *post mortem* examination until four days after death. The body was rapidly decomposing, especially about the neck and shoulders. Thorax: each pleural cavity contained about a pint of bloody serum. The lungs were free from adhesions; their structure was generally engorged with blood, but nowhere were any melanotic deposits detected. There was no effusion into the pericardium. The heart was flabby, and contained scarcely any blood. Abdomen: there was no effusion into the cavity of the peritoneum. The stomach and intestines were distended, apparently with gas. Their cavities were not exposed. The liver, the spleen, the pancreas, and the kidneys, were natural. The lumbar glands were unaffected. The bladder was natural. Head: the coverings of the brain were natural. The brain itself was softened by decomposition. At its base, to the right side of the medulla oblongata, and breaking up the substance of the Pons, was an extravasation of blood, infiltrating the cerebral substance for the distance of an inch. There was no fluid in the ventricular cavities. There were no appearances of melanotic deposits in any parts within the cranium.

I dissected out a large gland from below POUPART'S ligament, on the left side, which, together with two or three smaller ones in the vicinity, were diseased. On section, they all presented the appearances of medullary cancer and melanosis, their structures being partly white, and partly of the deepest black.

P. C., aged 53, a collier, married—a worn, pale-complexioned man—was admitted, under my care, in the Hospital, on the 24th March, 1855, having a black patch of diseased structure on the right cheek.

History.—He had always, within his recollection, a mole in this situation.

It had never occasioned him pain or annoyance until within three months of his admission. The first occasion of its doing so was after it had been accidentally wounded by a barber in shaving. After this it began to prick and shoot, and to increase slowly in dimensions. In earlier life he had been the subject of epileptic fits, but not for seventeen years had he suffered an attack. Though of delicate constitution, he had followed a laborious employment in the pits, and had encountered the hardships and accidents incidental to his occupation. He had always been temperate. His family are healthy, and there is no tendency to disease known amongst them. His wife informed me, that

for some months past he had been losing flesh, and had been the subject of cough and feeble digestion.

Upon examination, the growth presented an irregular black tuberculated patch of warty structure, situated immediately over the right malar bone. It was about as large as a florin piece, moveable with the integument, with its limits accurately defined. Its surface was not ulcerated, nor was the neighbouring integument affected. Closely adjacent to its outer margin, and connected by a small intermediate portion, were two tubercles, of the size of peas, which partook of the character of the larger one. The colour of these formations was coal-black, the only exception to this being a slight variation in intensity in different parts.

The submaxillary glands of the same side were enlarged and hardened. There were no other tubercles or discolourations to be seen on his body.

In consultation with my colleagues, we determined that no operation was advisable.

On the 10th of April, sixteen days after admission, he died suddenly, almost without warning, and without any illness, save an increasing feebleness and some vomiting.

The body was examined twenty-four hours after death.

Head: On examining the skull cap, its internal surface was observed to be irregularly marked by melanotic deposit; the same condition was present in the floor of the cranium. The colour of this deposit was deep black, it was scarcely raised from the surface of the bone, and whilst, in some instances, it penetrated inwards, so as to stretch across the diploe to the external table, in others it was readily removed by scraping, leaving the bone of its natural colour beneath. Thus it diffused itself in patches of irregular shapes and dimensions in all directions (Plate iii). It was altogether situated beneath the pericranium. This membrane was stained by contact in some few places on its external aspect, but there was no thickening or other change apparent in its structure. The brain was natural. Thorax: The lungs contained many nodules of melanosis. These were chiefly noticeable upon their posterior parts, and varied in size from a small pea to a cherry. They were circular in figure, intensely black in colour, and were situated mostly beneath the pleura, but were in the parenchyma of the organs as well. The lung structure around the deposits was perfectly natural, and was in immediate contact with them. The heart on its posterior aspect was sprinkled by jet black spots (Plate ix, *Fig.* 4). The melanotic matter constituting them was placed beneath the visceral pericardium. It showed itself towards the right of the septum ventriculorum, being scattered mainly over the surface of the left ventricle, just below the auriculo-ventricular furrow. It stretched over the space of an inch in length, and was at first separated into many small diffused points, of a greyish tint, and was finally gathered up into a large patch of a deep black colour. The cavities and the remaining parts of the viscus were natural. Abdomen: The liver was a mass of melanotic deposit, three times its natural size: it extended itself downwards, and to the left side, encroaching on the neighbouring regions. The melanotic tubera were of all sizes, from the minutest speck or grain, to others as large as a pigeon's egg. They filled the organs in all directions, appearing to be inserted in the midst of the hepatic structure, which was more tawny in colour and more friable than natural. They did not appear to coalesce with one another, but were isolated by intervening liver tissue, which was in immediate contact with their external surfaces without the intervention of a cyst. On the anterior surface, the peritonæal covering was elevated into a series of undulations, caused by the upheaving nodules beneath. Beyond being thus raised, the membrane presented no appearance of thinning. On section, the tubera had a homogeneous aspect. Their consistence varied, and was generally somewhat firmer than tallow, and they had nowhere undergone any softening. Their colour was deep black or brown, and of every shade between these two, The spleen contained similar deposits, three or four in number, of the size of swan shot. The kidneys were similarly affected. The small intestines were sprinkled in a few places. The mesenteric glands were dark coloured, and slightly enlarged.

The constitution of the patient suffers by gradual diminution of the vital powers, rather than by the influence of accompanying fever or pain—a slow wasting of the physical capabilities, without the mental powers sharing in the otherwise general decay. Death, especially in the second instance, was scarcely a remove from the previously existing state of intense feebleness; and yet there were evidences of the occupation of almost every important organ by abnormal products. The latter are in general fatal, not so much from the local injury which they produce as from their constitutional effects.

Take the first case as an illustration of this remark, and it will be found that in no internal organ was there evidence of secondary deposits, but the subcutaneous cellular membrane, from head to foot, was filled with them in every stage of growth; yet the cachexia was even more marked than in the second, where the great vital organs were absolutely filled with the disease, at the same time that the external cellular membrane presented hardly any traces.

The progress of the melanotic tubercle, in its course to the surface, was steadily in conformity with the peculiarities I have elsewhere described as belonging to it. In its subsequent career,

the absence of pain, of purulent discharge, and of anything approaching to the separation of its tissue by sloughing, were maintained as its features to the last.

As to the nature of the disease, almost all pathologists consider melanosis to be medullary cancer, with black pigment superadded. They further believe that the deposit of the pigment in the elementary structures of any kind of cancer is sufficient to entitle it to the name of melanosis. The scirrhus cancer, comparatively rarely, however, becomes associated with melanosis, but the encephaloid is constantly encountered in connection with it, presenting every possible degree of admixture.

The cut aspect of a tumour of melanotic cancer presents the consistence and the appearance, except as to colour, of medullary cancer; and even this exception to the complete resemblance, is only partial, as portions of the same tumour frequently display an absolute similarity in all respects.

Examined by the microscope, melanosis is found to present the same histological elements as are met with in encephaloid growths; with this difference, that granules of black pigment are found within the cancer cells, or interspersed amongst the other elements of the growth. In other respects—in dimensions, in multiplication, in rapidity of growth, in attacking almost any part, and at any age, and, in a word, in maintaining pre-eminently the cancerous features of destructiveness and incurability—the melanotic closely pursues the same course as the medullary tumour.

Diagnosis.—The description that I have previously given of melanosis will be quite sufficient to distinguish it from every other disease, with the exception of non-malignant melanosis of the skin. I will therefore briefly enumerate the chief differences between them. Malignant cutaneous melanosis arises generally in one spot, and that of small size. It is brownish black, or black, in colour. It is almost invariably adjacent to some congenital cutaneous affections, as moles or warts. It is, sooner or later, accompanied by the constitutional symptoms above referred to; and whilst it advances slowly in the skin, the secondary deposits form very rapidly.

Non-malignant cutaneous melanosis generally arises in many spots, and these of large size, at the same time. They are, moreover, of a deep black colour; and they never give rise to cachectic symptoms.

Treatment.—In the case of a wart, mole, or mark showing signs of melanotic degeneration, the parts affected should be speedily and completely extirpated by the knife, or wherever the primary disease may be located, the textures involved should be excised, if practicable, in the same manner.

Medicine has yet afforded no aid in the relief of melanosis beyond that which belongs to the requirements of cachectic conditions generally. The consideration of the facts contained in the cases I have detailed, leads to the conclusion that the removal of the disease by the knife is followed by the same results as have hitherto attended the removal of medullary cancers.

At present there are no data from which the average time can be ascertained that patients have survived after the removal of melanotic growths by the knife, which lead us to presume that that proceeding is attended by any more successful results than it is in cases of encephaloid in the same organs.

The tendency of this form of cancer is especially marked to return at the original seat when removed by operation. Thus, of twenty-five cases, I ascertained that twenty-two manifested a recurrence in the cicatrix, or displayed secondary deposits in the cellular tissue, or exhibited both. Moreover, the prospect of a rapid recurrence, so far as my experience extends, is very decided.

CHAPTER XV.

EPITHELIAL CANCER OF THE LIP.

EPITHELIAL cancer is of frequent occurrence in the lower lip. In the upper it is hardly ever seen. It is almost confined to men. Of the numerous cases that I have observed, I have only met with one instance in which a woman was the subject of the malady.

Essentially it is a disease of the latter half of life; it is most commonly met with between forty and fifty; and whilst abundant enough in very advanced life, it is very rarely seen under thirty years of age.

Of the influence of external causes in producing the disease little can be said with certainty. Cases present themselves from time to time in which it has followed an external injury; others where it resulted from repeated wounds in the same place with the razor; whilst a very general belief exists that of all predisposing causes none has so strong a claim to prominence as the long-continued use of the short pipe.

My own experience leads me to the conclusion that none of these causes in themselves are calculated to produce cancer of the lip in a person not predisposed to the disease. Certainly, amongst the vast number of people who smoke, there are not found more cases of cancer than are to be found generally amongst any given number of the population.

A far greater source of mischief springs from the tendency of patients to scratch or pick away any little scab, fissure, or sore on the lip. Moreover, the situation of the annoyance exposes it to the edges of the teeth, as well as the ceaseless movements of the tongue. By these means irritation is kept up, and that which might have healed as a simple sore remains to fix itself more deeply and widely by slow ulceration.

The earliest appearance of the disease is often in the shape of a little button-like tubercle, situated near the junction of the mucous membrane and the skin—most frequently on that part of the lip that lies between its centre and the commissure of the mouth. Sometimes a mere sore forms, and sometimes a little crack or fissure.

Under any of these modes of origin, there is always more or less induration present. As time goes on a thin discharge scabs over the surface. Repeated removals of this, lead only to the production of inflammation, both in and around its seat. Gradually the sore widens and deepens, its edges becoming elevated and clearly defined. In some instances, without deepening, the sore is entirely prominent, its centre being filled in with granulations on a level with the edges.

In the early stage of this disease there cannot be said to be pain—a sense of itching and inconvenience alone being present.

Cancer of the lip, left to itself, affects the neighbouring glands. Those in direct anatomical

relation, the submaxillary, are very frequently found enlarged and hardened when the primitive disease is very small. Little by little the process of ulceration extends: skin, muscle, mucous membrane, bone, are each in turn destroyed, and other glands about the invaded parts undergo a similar change. The health of the patient, usually remarkably good, becomes worn down by continued discharge, whilst severe lancinating pains occasion much suffering. The destruction of the parts around the mouth interferes with mastication—the saliva dribbles away—and hæmorrhages not unfrequently assist to hasten the fatal termination. In other respects the organs of the patient are unaffected, and no developments of the cancer are found at a distance from the original seat of disease.

The following cases afford excellent illustrations of the disease.

J. M., *æt.* 58, an ironworker, was sent to me by Mr. J. H. Houghton, of Dudley, May 9th, 1865, on account of an extensive ulceration about the mouth.

History.—Two years since, a warty pimple came on the lower lip, on the right side, between the centre and the angle of the mouth, and situated as nearly as possible at the joining of the mucous membrane and the skin. For six months this remained quiet and was without pain. After this it began to spread, until it assumed its present appearance. Has never had any pain in it, nor has it in any way, as yet, affected his general health. Has been a smoker of short pipes for years—holding, however, his pipe on the opposite side to where the disease commenced. He says that during the last five weeks the ulceration has increased more rapidly than at any period previously. There is no history of cancer in his family.

Actual condition.—A very healthy, strong-looking man. The disease now occupies almost the entire surface of the chin and lower lip, stretching from either angle of the mouth, and folding itself on the right side in a marked curve (*Fig.* 16). The mass is composed of irregular warty granulations, raised considerably above surrounding parts, which neither bleed nor secrete much discharge, and which present the winding thickened edges, here and there raised and passing off into livid-coloured skin, so characteristic of advanced epithelial growths. The disease is closely adherent to the mucous membrane of the mouth, covering the adjacent gums. The submaxillary glands on the right side are enlarged and somewhat hardened. He has no pain.

The case being too far advanced for operative interference, I advised palliative measures, and subsequently learned from Mr. Houghton that the patient died on the 25th of September in the same year, worn out by the effects of the disease.

Fig. 16.

T. B., *æt.* 32, by trade a blacksmith, was admitted under my care in the Hospital December 17th, 1857, on account of a sore situated in the centre of the lower lip.

The patient has naturally a dark, swarthy complexion, which heightens his present unhealthy look.

History.—The disease began as a small scab, exactly in the centre of the lower lip. It did not enlarge for six months, then it grew slowly, and he sought advice as an out-door attendant. The position of the ulcer, and its appearance at this stage, induced me to hope that it might be syphilitic.

Accordingly he was placed under the influence of mercury, and external applications agreeing with this view were used to the sore. There was no history of cancer in his family, his habits had been temperate, but to this time he had been a confirmed smoker.

Actual condition.—In the exact centre of the lower lip, stretching rather more over the cutaneous than the mucous surface, is an ulcer of the size of a shilling. Its margins are well defined and hard, whilst the centre is somewhat excavated. There is no enlarged gland in the vicinity.

No change having been produced by the specific treatment, on the 22nd of December I excised the disease by the ordinary method, and the wound healing at once he was discharged in a few days afterwards.

March 1st, 1858.—Presented himself as an out-patient. Nine days since he perceived what appears to be a little gland, enlarged in the middle line beneath the jaw. It is as large as a horse-bean, hard, and moveable. The cicatrix is sound and free from pain.

July 5th.—There is a large secondary growth filling up the floor of the mouth, it is freely moveable and painless.

October 6th.—Re-admitted. A large excavated ulceration occupies the space between the symphysis of the lower jaw and the thyroid cartilage. Bleeding and sloughing are present and a marked cachexia. The cicatrix is unaffected.

November 7th.—Died from exhaustion.

Dissection.—There were no evidences of secondary deposits in any of the internal parts.

The destruction in front of the neck was most complete, the larynx being uncovered and the floor of the mouth penetrated. Ulcerative action appeared to have carried off the various textures after the first yielding of the skin, whilst there was no sign of the glands or surrounding parts being infiltrated by cancerous material.

J. M., *æt.* 64, a labourer, fresh and healthy-looking, was admitted under my care in the Hospital, November 30th, 1855, on account of a sore which had formed on the right side of the lower lip.

History.—The disease appeared six months since as a small pimple, near to the angle of the mouth on the right side, and was situated close to the junction of the red line of the lip with the skin. He always shaved it off on Sundays until it became too tender for the proceeding. About a month since, after a stimulating application, he found its growth increased, so he applied to the Hospital. He can assign no cause for its appearance. He has smoked, and has always carried his pipe on that side. His family history is without suspicion.

Actual condition.—The sore presents the ordinary appearance of epithelial cancer, and is about as large as a sixpence. There are no glands enlarged in the vicinity.

December 5th.—Excised the growth by widely cutting away by a sweep of the knife the portions of the lip to which it was attached.

28th.—Discharged well and without disfigurement.

Re-admitted February, 1858.—Twelve months after the operation he perceived a small hard swelling beneath the angle of the jaw on the right side. This gradually increased in size, and in six months broke through the skin. The pain was slight and of a dull character. The present condition (Feb. 20th), twenty-six months from the operation, is that the ulceration occupies the right side of the face, extending from the angle of the mouth, downwards, as far as the cricoid cartilage; backwards, to the lobe of ear, and terminated above by the lower edge of the malar bone. In the centre of this is a perforation into the cavity of the mouth, admitting of the passing of three fingers. Almost the whole descending and part of the horizontal rami of the lower jaw have disappeared in the formation of this opening. There is little constitutional disturbance, and hardly any pain. The cicatrix remains healthy.

March 13th.—An attack of hæmorrhage occurred from a vessel giving way in the lower part of cavity.

After this, hæmorrhages were repeated, erysipelas seized the entire face and head, and on the 24th of March the patient died.

Dissection.—There was no evidence whatever of secondary cancerous deposits in any of the internal parts. The organs were all, save the heart, in a natural condition. In the heart the aortic valves were deeply fringed by calcareous deposits of great magnitude.

The preceding cases, which I have selected from amongst very many others as being distinctly typical of certain features of this disease, happen, all of them, to manifest in their previous history the continued use of the short pipe. What amount of influence this habit exerts in the production of the malady in persons not predisposed to cancer I have already stated, so far as my experience extends; it is, however, at least remarkable that in the only instance in which I have seen the disease amongst women the short pipe should have been the constant companion for seventeen years.

C. G., a widow, *æt.* 62, came to me at the Hospital, April 10th, 1865, on account of a sore on her lower lip.

History.—The mother of thirteen children, of which eight are now alive and in good health. Has been a smoker, for seventeen years, of a short clay pipe, and always held it on the left side of the mouth.

Six months ago noticed what she thought was a chap or crack situated in her lower lip, towards the left commissure of the mouth. This was speedily followed by the formation of a scab, which from time to time dropped off from the sore beneath and then formed again, the sore itself gradually spreading. Her own health has always been good. There is no history of malignant disease in her family.

Actual condition.—A spare, healthy-looking woman. An ulcer as large as an almond occupies the red surface of the left half of the lower lip. It extends rather in length than breadth, but does not penetrate beyond the junction of the skin with the mucous membrane. The edges of the sore are elevated and irregular and very hard—this latter condition being present around the situation of the ulcer generally. A submaxillary gland in the same side can be felt enlarged.

The patient having, after much difficulty, consented to have the disease removed; she was admitted into the house, and, on the 16th of May, I excised it by the V-shaped incision, and she was discharged well on June 2nd.

May, 1867.—Mr. LATHAM, of Darlaston, informs me that C. G. remains well—the cicatrix, instead of being puckered and contracted, seeming quite elastic.

Diagnosis.—When epithelial cancer of the lip has advanced to its ulcerative stage it may be mistaken either for rodent ulcer, for indurated chancre, or for cancroid ulcer. The first-mentioned of these diseases is not often met with in the lips, and when it does attack them it is almost without an exception the upper lip that is affected by it. Rodent ulcer is not a malignant disease; it never affects the neighbouring glands; its progress is very slow but sure; and it involves all the surrounding tissues and even the bone itself in its destructive course, as I shall hereafter have occasion to show. The ulcer is generally very irregularly excavated, being much deeper in some parts than in others; and one of its most distinctive characters is that the surface of the ulcer is smooth—that is to say, it presents no outgrowths, nor any of the sprouting, vascular, and rapidly-growing granulations which are so common to the true cancerous ulcer. Its margins are hard and often tuberculated, but neither undermined nor everted; and one of the most certain and most characteristic points of difference between this ulcer and the malignant ones, is, that the progress of the ulcerative action is never accompanied by a coincident deposit in the tissues surrounding the ulcers. There is very little discharge from the surface of these ulcers, and what discharge there is, is seldom either of a purulent or sanguineous nature—it is rather a thin, dirty ichor. The pain attending this disease is very much less than it is in epithelial cancer. I have only met with one case in which the lower lip was attacked by rodent ulcer; and, as the case is not only a very remarkable one in itself, but illustrates in a very clear manner the chief points of difference above mentioned, I shall now relate it. If the woodcut *Fig.* 17 is compared with that of the last case, the striking difference in the appearance of these diseases will be at once evident.

S. K., *æt.* 75, a servant, from Stourbridge, was admitted under my care in the Hospital April 20th, 1864, on account of an ulceration about his mouth.

History.—Has had good health until about thirty years ago, when he got wet through, and since that has been much troubled with his health. He has paralysis agitans of both arms, which he attributes to a severe nervous shock some ten years ago, he being then in great pecuniary and domestic trouble. The ulceration of the lips was caused by a blow received, two years ago, from a man's fist. This blow cut through both lips, and also made a gash into his nose. The wound of the nose and upper lip soon healed, but the one on the lower lip refused to do so; it remained for two months in this condition. He then went to a druggist, who gave him some lotion to apply; but, after a second two months had elapsed, it began slowly to extend. The cut was a little to the right of the median line of the lower lip, and the ulceration extended more rapidly on the right than on the left side: it extended round the margin of the lips, chiefly along the prolabium, but at the right angle of the mouth spreading also to the skin, and then along the mucous membrane of the upper lip. Whilst thus extending along the margin of the upper lip, it also extended downwards towards the inferior margin of the lower maxilla. The edges of the ulcer were of almost cartilaginous hardness. He has lost all his teeth for nearly thirty years; they came out without being decayed, and he is not aware of having ever been salivated; he has never smoked or chewed tobacco. He has never heard of any of his family ever having had tumours of any kind.

Present condition.—A spare, worn-looking old man. Around the mouth is a large ulcer with irregular edges, involving the lower lip to a greater extent than the upper. The ulceration extends from the left commissure, along the lower lip, round the position of the right commissure (which is destroyed), to a spot a little to the right of the middle line of the upper lip. The depth and degree to which the destruction goes varies in different parts of the ulcer (*Fig.* 17). It is deepest at the middle of the lower lip, at the spot where the original wound was situated. At this spot the lip is destroyed, the ulceration extending into the gums and affecting the jaw itself. The skin and gum at this point are

destroyed to the same level. From this deep portion of the ulceration the wound gradually slopes up towards the right commissure. In the upper lip, the line of ulceration extends from near the angle of the mouth upwards towards the outer margin of the ala of the nose, terminating near the middle line of the upper lip. At this part the skin is destroyed to a greater extent than the mucous membrane. At the part where the ulceration is most extensive, the skin is closely adherent to the jaw, but the upper lip at the left side is free from hardening and moveable. At the edge of the lower jaw, near the symphysis, is a nodule of extreme hardness, and there are several nodules along the upper lip.

This patient remained in the Hospital for a period of six weeks; at the end of which time he returned home, the ulcer having increased a little in all directions.

I was unable to learn the date of his death.

Fig. 17.

With regard to indurated chancres of the lips, it must be admitted that it is impossible to distinguish them under certain circumstances, by their mere appearance, from epithelial ulcers; but their history, especially the rapidity of their formation after the first appearance of any disease in the part; the almost coincident induration of the glands—not the nearest glands, as in the case of cancer, but generally the post-cervical; and the rapid development of the constitutional symptoms of syphilis, will in all cases enable the surgeon to distinguish this disease from epithelial cancer before any operation for its removal need be performed. But if any doubt should remain it may be solved by observing the effects of anti-venereal treatment.

Cancroid ulcer of the lip.—I apply this term to an intractable spreading ulceration which is often met with on the lip as well as on other cutaneous or mucous surfaces. It commences either as an outgrowth in the shape of a papillary hypertrophy or wart, or as a tubercle more or less hard and resisting, situated in the substance of the lip. In whichever way it commences it frequently remains in a perfectly quiescent state for a considerable period, often for many years, and produces no pain and but little inconvenience. At length, however, a change takes place in it, which causes it to crack and ulcerate; the ulcer extends slowly, and often heals at one part whilst it is extending in an opposite direction. There is but little discharge from it as a general rule, but this is liable to exceptions, and there is sometimes hæmorrhage arising from the vascularity of the granulations with which its surface is covered, but it never gives rise to those extensive outgrowths from its surface and margin which are so well illustrated in the case of J. M., *Fig.* 16. However deeply the disease may spread it never passes through or involves the bone, and there is no infiltration round the margin of the ulcer, but merely a slight inflammatory induration. The proximate lymphatic glands often become tender and enlarged, but they are not indurated nor infiltrated with any morbid product. The general health remains unaffected, and if the disease be

removed it does not return. Hence the success which often attends the operations for supposed cancer of the lip in the practice of many eminent surgeons. The case of S. H. is an example of the tubercular form of the disease I am now describing.

Mr. S. H., *æt.* 66, from Armitage, was sent to me September 26th, 1861, by Mr. Shirley Palmer, on account of a growth in his lower lip.

History.—Nine months ago he first detected a small pea-like body situated in the thickness of the lip, towards the right angle of the mouth. He knows no cause for its appearance, and is not a smoker. After a time this grew nearer the surface, and ulcerated, and the parts around thickened and became slightly painful. About three months after its appearance it was partially removed by the application of caustic. No history of cancer in his family.

Present condition.—Florid and healthy-looking. On the upper red margin and surface of lower lip, close to the right angle of the mouth, is situated a warty ulceration, spreading inwards, affecting the entire thickness of the lip, and having the mucous surface adherent to the induration below the sore. The disease is quite circumscribed, and there are no enlarged glands.

I excised the growth by the V-shaped incision, the same day, closing the wound by two hare-lip pins, which I afterwards removed on the third day, the line of union being complete.

The patient at this time remains well. Dr. D. H. Monckton, of Rugeley, near whom Mr. S. H. resides, writes to me under date January 28th, 1867: "I have taken an opportunity of calling on your patient; he is in perfect health; he is seventy-two. The cicatrix sound, not unsightly, indeed barely visible. There is not the slightest threatening of return of the disease."

It is always desirable that these ulcers should be completely removed as soon as possible after their appearance, for in some cases, and under certain unknown circumstances, when they have continued for a long period without undergoing any obvious change, they become the nidus of true epithelial cancer, which then advances rapidly and soon terminates in the death of the patient. It is a very remarkable fact that the true epithelial cancer may attack a part in the vicinity of the original disease, the latter having undergone no change in its original benignant character from the time of its first appearance. This, so far as my experience extends, is quite contrary to what occurs in epithelial cancer; for I know of no authentic instance in which a secondary epithelial disease developed itself, the original disease being at the same time in a quiescent and inactive state. The case of W. T. will illustrate these remarks: here the original wart on the lip did not undergo any change from the time of its first appearance until the death of the patient—more than fifteen years—whilst a primary cancerous disease attacked the parts beneath the lower jaw. If the original tubercle had ulcerated, the disease would have been looked upon with certainty as one of true epithelial cancer of the lip.

W. T., *æt.* 40, married, a farm bailiff, from Kingsbury, of robust and healthy appearance, was admitted under my care in the Hospital April 9th, 1860.

History.—Fourteen or fifteen years ago a small growth, which had all the characters of an ordinary wart, came on his lower lip—rather to the left of median line—a little beyond the point of junction of the red margin with the skin. When this had attained the size of a pea it was destroyed by nitrate of silver. Soon afterwards a small hard body was detected in the substance of the lip, immediately below the situation of the former growth. About six months since a small swelling commenced, beneath the left lower jaw over the situation of the submaxillary gland. This rapidly increased, and, becoming of great size and apparently soft, an opening was made into it and blood and matter evacuated. There is no history of cancer in his family.

Actual condition.—The tubercle in the lip is seen to be free from ulceration of any kind. It is, indeed, as quiet and unchanged as it has been for years.

Beneath the jaw is a deep-spreading ulceration, extending from the thyroid cartilage upwards to the parotid gland.

Finding that no relief could be afforded him by operative interference, he left the Hospital after a few days.

June 11th.—By the request of his employer I visited this patient at Kingsbury. I found him greatly emaciated, profoundly cachectic in appearance, and complaining of severe aching pains in his limbs. The entire space between the chin and sternum was exposed by destructive ulceration and sloughing. The cartilages of the larynx and trachea were bare, and the spaces on their sides as far as the sterno-mastoid muscles. The small tubercle on the lip had not altered in any way.

There had been no hæmorrhage.

He died July 3rd. There was no P.M. examination.

Treatment.—Cancer of the lip may be removed by the knife, or may be destroyed by the action of caustic. Internal remedies are of no assistance, and any other external ones are equally valueless.

In no case of cancer of the lip have I seen reason to prefer the use of caustic to that of the knife. On the contrary, I have the strongest conviction that caustic has itself proved one of the greatest sources of irritation in many cases where its incomplete application sufficed only to provoke inflammation.

When, therefore, we consider the uncertainty of diagnosis which belongs to this disease, in the period when interference is most desirable, and that the treatment by complete excision may, in many cases, effect a cure whether the case be one of cancroid or cancer, we are at a loss to account for the number of cases that present themselves in a hopeless state, attained not less by the apathy of the patient than by the indifference of the surgeon to an early interference.

Removal by the knife.—The most ordinary method in which the disease is excised is that which consists of including the whole of it in a V-shaped incision. This proceeding is simply effected by the surgeon transfixing, with a double-edged knife, the covering of the chin well below the sore, and at once carrying the knife upwards, in a slanting direction, dividing everything at one sweep. Whilst an assistant grasps the flap, to stay bleeding, with one hand, with the other he makes tense the part containing the disease, which is speedily removed by a second incision from above downwards, until it meets the first at the point of commencement. The bleeding in this flap the surgeon himself controls with the finger and thumb of the left hand. The wound is at once closed by two or three hare-lip pins, care being taken to have the red lines of the severed lip accurately in apposition. The pins being secured by a few turns of silk, collodion should be applied in the course of the wound and the operation is completed.

The pins should be removed on the third day, the turns of the silk receiving a fresh layer of collodion, and being permitted to remain on during the few days that the healing process is incomplete.

Another method is by including the disease in a semilunar incision at a single sweep of the knife, commencing and terminating at a sufficient distance beyond the seat and passing freely below it, so as to have its concavity directed upwards. The wound thus made is left to fill in by granulations.

Either of these methods will suffice to remove the disease completely; and so pliant are the parts about the mouth that the disfigurement resulting from the loss of substance is of the most trivial character.

The first method is, perhaps, more applicable to cases where the disease extends on to the integuments of the chin, than to those where it is confined to the lip itself.

In making use of the V-shaped incision the surgeon should bear in mind the great importance that belongs to his carrying the knife wide of the disease. This circumstance is apt to be lost sight of, as the incision on either side, widely apart at first, approximates closer and closer to its fellow as it nears the apex.

In escaping this drawback the semilunar incision presents a decided advantage.

Where it is determined to use caustic it should be applied promptly and freely. The best, in my experience, is the chloride of zinc. This may be made into a paste by the addition of either flour or plaster of Paris. The most manageable form will be found to be one part of the caustic to three parts of the vehicle, mixed with a few drops of water. The paste thus made is to be spread over the surface of the sore to a depth of from two to three lines, and is to be allowed to remain on for a period of from six or eight to ten hours, according to the tolerance, on the part of the patient, of the pain which it always occasions. At the end of ten or fourteen days the thick white eschar, formed by the caustic, is thrown off, leaving a clean, granulating surface in its place. If any hardness extends beyond the sore the epidermis must be removed from it, so as to include it completely in the range of the caustic.

To relieve the pain, so agonizing in the vast majority of cases of cancer treated by caustics, no remedy will avail so much as extreme cold—whether derived from the evaporation of ether, the admixture of ice and salt, or any other frigorific compound.

Where the ulceration in cancer of the lip has extended to the chin an autoplastic operation may afford great relief to the patient.

So elastic are the parts about this region that very great losses of the soft textures, and even of the bones themselves, can be sustained with comparative impunity.

No fixed plan of proceeding can, however, be laid down. Each case will have to be treated, as it comes before the surgeon, on the special extent and relations of its ulcerating activity. In all instances the object to be accomplished is the same—to completely remove the disease, and to cover in the gap with sound parts taken from the surrounding spaces.

This operation must always be regarded as palliative, and though the extent of diseased surface may hardly prove a barrier to its being undertaken, the existence of enlarged glands in the vicinity should ever determine the surgeon against its performance.

After removal by operation, where the disease recurs, the tendency is for it to appear again in the same seat or very near to it. Where it recurs in the cicatrix, and the proceeding is practicable, it should, without delay, be again excised as extensively as possible.

The following case illustrates the amount of restoration to the natural condition of parts which may be attained after the removal of very considerable portions of the lip by two operations.

Mr. J. H., *æt.* 67, a very healthy, vigorous man, was brought to me, March 31st, 1865, by the late Mr. Middleton, of Leamington, on account of an ulcer situated on his lower lip.

History.—Two years since he observed a scab. He picked it off and it repeated itself and formed, after a time, a sore. Has been a moderate smoker. No history of cancer in his family.

Actual condition.—An ulceration of the size of a sixpence is placed on the red surface of the lip, about midway between the centre and right commissure. It is elevated; its edges are irregular and hard, and the adjacent parts are very dense. It is without pain, and there are no enlarged glands.

I advised its immediate removal, and accordingly effected it at once by the V-shaped incision. The parts healed without disfigurement in a few days.

On December 4th, 1866, Mr. J. H. came to me again. He informed me that about six weeks previously, his health being as good as ever, the disease reappeared and had gradually increased.

On examination I found a growth almost identical with the first, situated in the cicatrix on the red surface of the lip. There were no enlarged glands.

Finding that there would still be room to bring the parts together, I again advised excision, and carried it out the same day by another V-shaped section, cutting freely beyond the disease into the soft parts of the cheek, without, however, lengthening the mouth by dividing the commissure. Notwithstanding the large amount removed at these two operations, the parts came together with only a moderate degree of tension—the opening of the mouth being of course greatly reduced. The wound healed, but the patient suffered greatly from severe constitutional disturbance for some few weeks afterwards.

May 1st, 1867.—Mr. Page, of Eydon, near Banbury, writes to say, that Mr. H. is perfectly free from any return of the disease, and now, with the exception of a very diminished size of the mouth, is quite well.

Very often, however, the cicatrix remains sound, whilst the disease manifests itself in the adjacent soft parts of neck and face, or in the lower maxilla.

This latter circumstance was especially noticeable in two instances that came under my observation very much at the same time. I had removed a marked epithelial cancer from the lower lip of a man—E. K., *æt.* 65—in the Hospital, in September 1863, which had been five years in growing. He left with the wound quite healed. In a year and a half afterwards he came to me again. The wound on the lip was still sound, but the lower jaw on the left side was occupied by a large hard and nodulated tumour. This had appeared some five weeks since, had given him great pain, and was evidently rapidly increasing.

The other instance was also a well-marked case of epithelioma, the man, H. S., was aged 66. A pimple had come on his lower lip four years previously to my seeing him. For two years it was quiet—then it grew, and in June, 1844, I removed it in the Hospital. The parts completely

healed, and I did not see him again until fifteen months afterwards. The cicatrix of the lip was sound, but the lower jaw on the left side, extending from the second bicuspid tooth to the angle, was occupied by a hard irregular tumour, measuring nearly three inches in either diameter. This growth had appeared some six months previously.

In both these cases—which terminated fatally shortly after my seeing them—the secondary deposit of cancer was within the structure of the bone itself.

CHAPTER XVI.

EPITHELIAL CANCER OF THE TONGUE.

CANCER of the tongue ordinarily commences in one of two different ways. Either as a small, hard, irregularly-shaped tumour, or as a mere sore, boil, or excrescence.

It usually shows itself beneath the free surface of the upper or under aspects or at the edges, but it rarely occupies at first the entire thickness of the part.

The tendency to ulceration is marked and rapid, and the edges of the sore become hardened, elevated, and irregular. For a long time the ulceration is confined to one side or the tip of the organ, and very slowly and in very rare instances does it ever extend across the raphe.

At first there is little pain or inconvenience. As the disease advances there is difficulty in swallowing and a sense of weight in the organ, whilst, afterwards, severe lancinating pains occur periodically. The greatest distress arises further on, from accumulations of saliva and mucus, and fœtid discharges. Food can only be imperfectly taken, and the act of deglutition assumes a condition of the most painful character. With the spread of the disease the glands in immediate relation with the affected part become enlarged, and not unfrequently deposits of cancer extend themselves on the sides of the pharynx—more rarely they are observed in remoter parts. Where the seat of the disease is far back on the dorsum, or implicates by extension the pillars of the fauces, an incessant spitting of saliva is often observed, together with irritable cough.

The general health, at the onset and for a considerable time remarkably good, suffers in many cases afterwards more from the impossibility of taking food than from the spread of the cancer. The patient becomes eminently cachectic; and, worn down by fœtid exhalations, in the very centre of the most necessary enjoyments of life, he succumbs from exhaustion, from starvation, and sometimes from hæmorrhage.

Mrs. L., *æt.* 32, from Dudley, consulted me, July 10th, 1862, on account of an ulceration in her tongue.

History.—Three years since she first noticed a small boil on the left side of the tongue. This kept quiet up to the last six months, when it broke and formed an open sore. The teeth on the lower jaw on the same side were long in a state of decay, and have, from time to time, been removed, with the exception of the last molar. There is no history of cancer in the family.

Present condition.—A very healthy person of pale complexion, the mother of two children, the youngest being eight years of age. The ulceration is about an inch long, occupies the dorsum of the tongue close to the margin, extends in the long diameter of the organ, and indurates the adjacent structure, its centre being irregularly deepened by the progress of the malady. Complains of some smarting pains. Finding that, under the direction of Mr. Badley, of Dudley, she had taken the iodide of potassium and had applied iodine to the sore without alteration, the syrup of the iodide of iron was substituted with a simple gargle of myrrh. I informed her friends that the disease was incurable, and that I could not advise any operative measure.

January 22nd, 1863.—Disease increasing in the tongue. There is marked hardness down the pharynx on the left side. Cachexia.

May 22nd.—Visited me. Thinner and paler. Tongue more indurated. No hæmorrhage. Deglutition difficult. Enlargement along pharynx more marked. Ordered abundant nourishment and to continue the iron.

October 29th.—Mr. Badley writes—"Our patient, Mrs. L., is still alive but gradually wearing down. The disease has not made such rapid progress as might have been expected. It has invaded the other side of the tongue, so that the whole organ is now one indurated mass, filling up the mouth, and, at times, rendering deglutition most difficult. There is one deep chasm in it from which, at times, there has been considerable hæmorrhage. The swelling in the neck slowly enlarges and seems to press on the nerves, for she suffers occasional paroxysms of severe pain, that seem to arise from this spot and radiate over the side of the head."

This patient died in July, 1864. There was no very great extension of the disease, but repeated attacks of hæmorrhage led to final exhaustion.

Anne W., *æt.* 33, single, came as an out-patient to the Hospital under my care June 22nd, 1863, on account of a disease in her tongue.

History.—Has had many decayed teeth. Twelve months ago noticed a small wart on the upper surface of the right side of the tongue. The margin of this speedily became sore, and the ulceration spread. With this extension there was severe pain, and latterly two attacks of hæmorrhage. Her paternal grandmother died of cancer of the antrum.

Present condition.—Ulceration of an epithelial character extends from the tip of the tongue to an inch and a half backwards on the dorsum. It has spread underneath towards the frœnum, and the margins of the organ are rendered ragged and indurated, and on the right side show the indentation of a carious molar tooth yet remaining. Some parts of this ulceration are of a superficial character, but towards the frœnum it penetrates deeper into the substance of the tongue. On the right side there is a single gland enlarged close to the angle of the jaw.

The disease progressed, and on the 26th of October, 1863, she died, having been exhausted by an attack of hæmorrhage two days previously.

C. M., *æt.* 51, married, by occupation an umbrella maker, was admitted under my care in the Hospital, February 5th, 1867, on account of a cancerous growth in his tongue.

History.—Has generally had good health. Thirteen months since a small sore formed on the tip of his tongue. This caused him little pain; and, though it never healed, it did not increase materially until six weeks back, when, after a drinking bout, his tongue became swollen and painful, appearing to fill his mouth, and the ulceration rapidly extended. Has been a confirmed smoker of short pipes from earliest youth. There is no history of cancer in his family.

Actual condition.—A pale, cachectic-looking man. Speech difficult to make out—saliva running over lips. On asking him to protrude the tongue, its entire extremity is seen to be occupied for a distance of nearly an inch and a half by a dirty, slonghing sore. The edges of this posteriorly are abruptly separated from healthy tongue, by very hard, winding, irregular, and elevated edges. The entire thickness of the tongue as well as its margins are affected, and convey to the fingers a sensation of great density and enlargement. Beyond the disease the remainder of the part is healthy. Two small glands are to be felt hardened beneath the maxillary bone. He says that his pain is not severe, except on coughing; but that his great suffering arises from attempting to swallow, which he can only effect, after many attempts, by first protruding the tongue. The upper and lower front teeth are profoundly carious, with the gums receding from their roots, whilst the secretions from the mouth are sanious and fœtid.

February 13th.—Having passed a straight needle well beyond the limits of the disease, through the substance of the tongue itself, I fixed the chain of the écraseur behind this, and slowly severed the ulcerated parts. Its removal was completed without hæmorrhage. A section of the disease presented in a marked degree the appearances of an epithelial formation, conveying, on being cut, a sensation like that derived from a dense fibrous material.

After the operation, the patient from day to day expressed himself as wonderfully relieved. The wound granulated healthily, and he left the Hospital, February 20th, to resume his employment.

March 18th.—Came to me as an out-patient. He is much improved in health. The sore is completely healed. At the free surface, however, there is evident induration.

Of the cause of cancer of the tongue it is impossible to speak with any degree of certainty. The short pipe is naturally referred to, but cancer of the tongue is as frequent among women as among men. With more reason are carious and ragged teeth accused of determining the commencement; and I cannot, myself, recollect having seen an instance of the disease in the presence of a completely sound set of teeth. To the preceding I would add, the degeneration of intractable ulcers originating from syphilis.

It belongs mostly to the middle period of life, between thirty-five and fifty; and though by no means uncommon in extreme old age, it is very rarely met with under thirty years.

Diagnosis.—Cancer of the tongue may be mistaken either for chronic ulcer of the tongue or for syphilitic disease.

Chronic ulcers of the tongue frequently bear a very great resemblance to cancerous disease in its earlier stages, but they do not spread with anything like the rapidity of cancer, and never destroy so much of the substance of the tongue. They are attended with comparatively little pain, and there is but little induration of the edges of the ulcer. Moreover, the lymphatic glands seldom become affected, and when they do so it is but to a very slight extent, the glands being swollen and tender—but they remain distinct, and never form a large tumour as they do in cancerous disease.

When the ulcer is of syphilitic origin, we have, in addition to the characters just mentioned as distinctive of chronic ulcers, the history of previous syphilitic disease or the actual presence of some of the well-known symptoms of it, such as sore throat, cutaneous eruptions, &c. When any glandular affections are present it will nearly always be found that they have preceded or accompanied the disease in the tongue; no reliance can be placed on the situation of these ulcers, although probably the majority of syphilitic ulcers are situated on the surface of the organs. If the case is a doubtful one, resort should be had to an anti-venereal course of treatment, which will very speedily cure the disease if it be of syphilitic origin, whilst it will have no effect, or rather none but an injurious one, on the malignant disease.

To recapitulate—the characteristic marks of cancerous ulcer of the tongue are, the great hardness and extensive induration of the edges of the ulcer—the rapid progress it makes—the great destruction of the substance of the tongue—the very severe pain—and, lastly, the very extensive affection of the glands, generally on the side affected, though frequently on both sides, and which increase with great rapidity and often form a very large and painful tumour.

Treatment.—There are no remedies with which we are at present acquainted that exercise any influence in retarding the progress of this disease. The powers of life must then be sustained on the same principles as those which guide us in our treatment of all exhausting disorders.

All sources of irritation should be at once withdrawn; and, with this view, any decayed teeth should be taken away, and the surfaces of the apparently sound ones examined in order to smooth down any cutting edges.

The application of caustics of all degrees, save the actual one, will only serve, in my judgment, to excite inflammation.

Great comfort will, however, be derived by the judicious use of gargles. The character of these will depend in great degree on the nature and extent of the discharge—whether fœtid, sanguineous, or otherwise. For the relief of the first nothing answers better than gargles containing biborate of soda, or chlorate of potash, or solutions of chlorinated soda, or of permanganate of potash.

Where bleeding takes place after the use of the ordinary astringent means, the tincture of the sesquichloride of iron, applied on lint, will very often prove effectual; and, lastly, in the failure of these remedies, the actual cautery should be applied without hesitation.

Our only means of arresting the progress of cancer of the tongue consists in resorting to an operation. This, to be of any service, cannot be done too early, and the utmost care should be taken to remove the diseased part as freely as possible from the midst of the otherwise healthy organ. When the neighbouring glands are affected in a decided degree, or when the parts in the floor of the mouth are likewise implicated, no operation should be practised. A mere enlargement of the neighbouring glands in the presence of unchanged general health should not prevent interference, as the enlargement may be due to merely sympathetic irritation, which may subside on removal of the cause.

Under the best aspects the treatment of cancer of the tongue by operation can only be looked on as a palliative measure, the tendency after all operative interference, however well considered, being to a speedy relapse.

Portions of the tongue containing cancer may be removed by the use of the knife or ligature. The écraseur may take the place of the knife in effecting this object, dependent on the position and extent of the disease in particular cases.

In all of these proceedings the patient should be seated, and the mouth kept open by the introduction of a piece of wood or cork placed between the molar teeth of the opposite side. Previously to commencing the operation a strong ligature should be passed through the healthy portion of the tongue, well away from the disease, by which the organ can be drawn forward by an assistant, and the part to be operated on brought within reach of the surgeon.

Where the disease is situated at the free portion, or is very circumscribed and seated near the surface of the dorsum, the knife may very readily be used, and the bleeding be effectually controlled by ligature, by the free use of ice, or by the actual cautery.

Under similar circumstances the ligature may be adopted. Strong whipcord, doubled and well waxed, is passed by means of a curved-eyed needle, fixed in a handle, well behind the disease. The needle is then withdrawn, and the strings tightly tied on either side so as to effectually strangle the part to be removed. In some cases the use of a more complicated means of securing the strangulation by the ligature may be desired, as in the removal of nævi.

By the écraseur either very small or very large sections of the tongue can be separated with great facility, and with yet more of security as regards bleeding. In using this instrument I have generally observed the following method. An assistant having fixed the tongue with the usual ligature, a curved needle is thrust from below upwards well beyond the limits of the disease, at a spot corresponding to where the chain of the écraseur should commence its operation. The needle thus serves the double purpose of marking the limit of the part to be severed, and of preventing the chain from slipping in its commencement. The chain is now cast behind the needle, and having been fixed on the instrument, the severance of the diseased mass should be most slowly proceeded with.

Of these methods I prefer that by the écraseur; for, by the knife, the loss of blood is always considerable, and sometimes even dangerous. By the ligature, the operation is acutely painful, and in subsequent progress, tedious and distressing; whilst the écraseur effects its purpose with no great pain, is unattended by serious risk of bleeding, the resulting wound being of small dimensions and in a state adapted for prompt repair.

In cases where the disease occupies the organ extensively, infiltrating its entire substance and especially its posterior part, the above proceedings are of no avail. Here it has been proposed to extirpate the part completely; and with this object, and in order to facilitate the operation, and to enable the surgeon to have a clear space for what he has to do, and to be able more readily to arrest bleeding, the lip and soft parts to within a short distance of the hyoid bone are divided in the middle line, and the symphysis of the lower jaw itself sawn through. The tongue is then drawn forwards by vulsellum-forceps, and its severance rapidly effected by the knife or deliberately by the chain of the écraseur.

This proceeding, in all its completeness, owes its first practical illustrations to Professor Syme in this country.

When the pain is very severe it may be effectually relieved, for a time at least, by the division of the gustatory nerve on the side affected, as originally suggested and practised by Mr. Hilton.

At present, surgery possesses no other alternative than this in the further treatment of cancer of the tongue, an alternative that has as yet scarcely commended itself as a means of arresting the progress of the malady.

CHAPTER XVII.

EPITHELIAL CANCER OF THE SCROTUM.

EPITHELIAL cancer of the scrotum—sweepers' or soot cancer, by which latter term it is yet generally recognized in this country—is an eminently serious and fatal malady.

So far as this neighbourhood is concerned it is a disease of frequent occurrence, and in my experience absolutely confined to sweeps. Notwithstanding the multifarious occupations which might be supposed likely to induce its onset in persons so predisposed, and which around Birmingham are followed by thousands, I am not aware of the local surgical annals affording a single instance of its presence in any patient who has followed another employment.

Of the cases that have come under my own observation, the oldest was forty-six and the youngest twenty, but almost all were between the ages of thirty and forty years.

There can be no other cause assigned for the production of this cancer than the irritating effects of the soot retained in a region peculiarly little exposed to cleanliness and singularly adapted to the detention of minute particles of matter.

These circumstances, then, exercise their influence and prevail in persons predisposed to cancer, in determining the production of this particular form of disease. To this conclusion experience fairly points, as it does also to the fact that hundreds may follow the avocation of a sweep without being so affected.

In the absence of this predisposition, the soot particles have, in my judgment, no more influence in causation than have the short pipes in the production of cancers in the lips.

Symptoms.—The disease first makes its appearance as a small warty growth, situated generally in the front part of the scrotum. This formation is never much elevated above the skin, and increases rather by spreading and forming a wider base of attachment. If there are several warts they gradually join each other, and in some cases present a flattened, cauliflower-like surface. For a considerable time there is no discharge, afterwards a thin fluid escapes, and, crusts of matter adhering, ulceration is discovered slowly proceeding as they drop or are rubbed off. This ulceration gradually penetrates the subjacent parts, widening as well as deepening, having its edges elevated, irregular, and hardened. The discharge is all along thin and eminently offensive. As the ravages of the disease extend themselves the whole of the scrotum disappears, the testes are exposed and hang pendulous in the midst of the granulations; the penis not unfrequently is absolutely eaten through, and the ulceration spreads on the pubes and the groins.

Sometimes when the primary disease is only represented by a small wart not larger than a pea, the inguinal glands enlarge by sympathetic irritation, and, the skin giving way to their growth as they have become further diseased, a sore with raised edges and deeply excavated takes their

place. In the process of these destructions, blood vessels give way and repeated hæmorrhages exhaust the patient no less than the extent of the discharging surfaces.

Beyond the affection of the glands of the groin and those of the lumbar region which present deposits of cancer identical in appearance with the primary disease, no other implications of more distant parts are discovered.

In the first onset of this disease pain is not present. The parts simply itch and feel irritable. Afterwards the ulceration is attended by severe smarting sensations which are very persistent and wear away the strength. The effect on the patient's powers, however, is by no means rapid, no doubt owing to the chief vital organs remaining unimpaired. These symptoms are well marked in the cases of L. C. and J. M.

L. C., *æt.* 30, married, a chimney sweep, from Tamworth, was admitted under my care in the Hospital January 23rd, 1857.

Thin and sallow in appearance, he had well nigh from infancy followed his employment in contact with the soot. At the end of 1855 he first perceived a hard, warty growth on the scrotum, towards the left side. It was not larger than a pea, but was at times painful. As it increased in size the inguinal glands on the left became slightly enlarged. His family history presented no evidence of similar affections.

The growth was excised January 28th. It was about as large as a shilling piece, of irregular shape and warty character. On the 6th of March he was discharged, the wound in the scrotum having soundly healed. The inguinal glands were about as large as filberts, but were not painful.

April 17th. He returned to the Hospital. During his six weeks' absence the glands increased in size and ulcerated, so that on his now presenting himself for examination he exhibited a sore an inch and a half in extent, spreading and extremely painful.

During May and June he remained in the Hospital, and on July 4th the following note recorded his condition. The sore is of a peculiar excavated character, oval in shape, with irregular, elevated, hardened edges, measuring five inches in length by three in breadth, and discharging a thin, acrid fluid. He has much pain, has lost appetite, and is markedly cachectic in aspect and feeling. He returned home on 10th of July at his own request.

On January 15th, 1858, this patient died, no P. M. being allowed. Mr. BLAKE, of Tamworth, under whose observation he subsequently fell, thus writes to me relative to the progress of the disease: "The wound had the same appearance as when the sweep left the Hospital, but more than doubled in size. Contrary to my expectation the hæmorrhage was very trifling. There was extensive deposit in the inguinal glands of the opposite side rapidly proceeding to ulceration. He sank after a severe attack of diarrhœa."

J. M., *æt.* 31, married, by occupation a sweep, came under my notice for the relief of soot cancer.

History.—Five years since the disease first appeared as a little warty growth, on the right side of the scrotum. Has always himself had good health, and there is no history of cancer, or of any similar affection to his present one, in his family.

In February, 1860, as a patient in the Hospital, I completely excised the affected part.

In February, 1862, the disease having recurred in the same spot, the operation was repeated. Up to this date the neighbouring glands were unaffected. The wound left by this second operation entirely healed, but after the lapse of some months broke again into a sore, and gave rise at one time, by the extension of ulceration, to an attack of most serious arterial hæmorrhage.

I visited this patient several times at his home. The disease spread by slow ulceration, gradually cutting off the penis, exposing and eating away the testes, and stretching backwards to the perinæum and anus, and laterally to the groins.

On July 21st, 1863, he died.

Dissection twenty-four hours after death.

There were no secondary deposits of cancer in any of the internal organs. The inguinal glands on left side formed large tumours, which on section presented all the appearances of epithelial cancer.

Diagnosis.—I can scarcely imagine any affection of the scrotum that will be likely to be mistaken for soot cancer. An ordinary wart might be produced here as in other parts, and if so, would be treated in the same manner as the soot wart, with the difference only of being less likely to recur. I have never, however, seen any such warty growth. Lastly, any venereal affection would yield to specific treatment.

Treatment.—The very earliest manifestation of this disease should be completely excised by the knife. The use of caustic, in whatever form, is strongly to be condemned. For not only

is the scrotum, from its lax tissue, eminently unsuitable for this method of treatment, but the application itself, owing to its frequent ineffectual exhibition, only serves to arouse inflammation and to encourage the spread of the malady.

In cases where the glands of the groin can be dissected out, together with the primary disease, this further proceeding is advisable.

The mere enlargement of these glands need not, indeed, deter the surgeon from getting rid, by excision, of a foul sore on the scrotum, whenever he has an opportunity, as their condition by no means conveys the same notion of constitutional affection which a similar state of matters does in other cancerous diseases.

In some instances the extent of the ulceration and its adherence to the coverings of the testicle will prevent the surgeon from obtaining sufficient healthy parts to cover in the wound, without sacrificing one of these organs. This should be done without hesitation, rather than run the risk of leaving any unhealthy tissues behind. By doing so very severe cases may be subjected, with even facility, to operative interference, that otherwise must have been left to their fate. This proceeding I carried out in the cases of W. D. and C. R. (*Figs.* 18 and 19), narrated below.

C. R., *æt.* 36, by occupation a sweep, was admitted under my care in the Hospital July 30th, 1866.

History.—Fifteen months ago first perceived on the front part of the scrotum, on the right side, a warty substance. This was not much bigger than a pea, but, having scratched it, some discharge took place from the injured surface, and it increased to the size of the last joint of his thumb in the space of a few weeks. He applied no remedy. Gradually the disease occupied more surface, and within three months has increased at a greater rate, and the glands in the groin have enlarged. None of his family, all of whom are employed in the same business, have ever been similarly affected.

Present state.—From the root of the penis downwards, occupying the entire right lateral and front part of the scrotum, is situated a very extensive cancerous ulceration. The surface of this is very irregular, presenting at one part a number of fleshy tubercles, and in others being deeply excavated (*Fig.* 18). Everywhere it is indurated, inseparably united with the skin and adjacent surface of the testicle. The discharge is thin, and most offensive. The glands in both groins are enlarged, those on the right side being more so than on the left. He is an exceedingly strong, vigorous man, without any impairment of the general health.

Fig. 18.

August 9th.—I carefully dissected out the morbid structure. In this proceeding the wound was necessarily very large in order to remove all indurated parts. The right testicle was separated at its cord, and the root of the penis, inferiorly, freely incised, to obtain healthy covering. Care was taken to avoid opening the opposite cavity of the tunica vaginalis. The parts came well together, and in the course of a few weeks healed completely and apparently soundly.

On examination, the disease presented the physical and microscopical characters of epithelial cancer. The structure of the testicle, though externally adherent by its immediate covering to the ulceration, was perfectly natural.

W. D., *æt.* 23, single, by occupation a sweep, was admitted under my care in the Hospital October 21st, 1861, on account of an ulceration seated in the scrotum.

History.—Is a healthy-looking man, with unimpaired strength. Five years since he perceived a warty growth, situated at the upper and front part of the right division of the scrotum. This enlarged, but did not ulcerate for two years. Then he noticed a thin discharge, which scabbed; and twelve months afterwards, the part having spread considerably, for the first time occasioned pain of a shooting and burning character. This pain has the last six months greatly increased in severity, extending a short distance in the course of the cord, and inducing loss of rest, but he has managed to continue his employment until a fortnight since. His family history is satisfactory.

Present state.—Nearly the entire front of the scrotum is occupied by an irregular-shaped warty ulceration. The edges of this are hard and elevated. The sore itself is pale in colour, and destitute of granulations, and in the centre, over the situation of the right testis, it is deeply excavated. On the left side there is a little hardness and enlargement of the inguinal glands (*Fig.* 19).

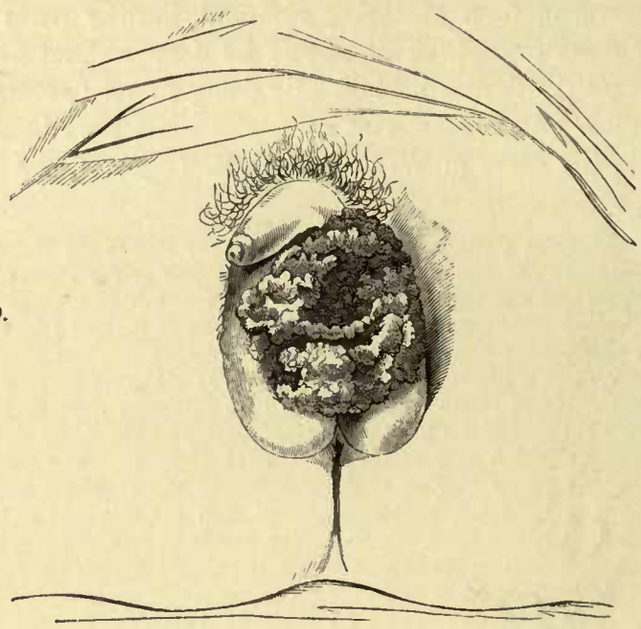


Fig. 19.

October 26th.—Under chloroform I proceeded to remove the affected scrotum. Finding the ulceration had extended so as to be adherent at one spot to the right testicle, I removed this gland in the ordinary way, in addition, both on this account but chiefly to obtain sufficient healthy skin to cover the large surface of wound left after the complete excision of the ulcerated surface. Indeed, without this additional proceeding it would have been impossible to have covered the wound.

The patient made a good recovery, retarded by some slight suppuration in the right groin.

In June, 1864, W. D. was at work at a colliery, in good health, and without any return of the disease.

January 19th, 1867.—W. D. was still at work at the colliery. He was without any return of the disease, and in good health.

In regard to the tendency for this disease in its true form to recur after removal, my own experience leads me to the belief that it is very great. Immediately it does re-appear in the site or neighbourhood of the first growth, excision should again be carried out, and again and again, as long as it is surgically practicable.

I repeat, an operation cannot be too early performed, so as to anticipate that deposit of cancerous elements which, sooner or later, takes place in these apparently otherwise simple formations. The surgeon may then fairly promise his patient the certainty of relief, and even the probability of a cure.

CHAPTER XVIII.

EPITHELIAL CANCER OF THE PENIS.

EPITHELIAL cancer takes its origin as a primary disease in various parts of the penis. The organ is likewise exposed, as we have already seen, to be attacked by the extension of this form of cancer from a primary centre situated on the scrotum.

Its most favourite seat is at the preputial edge of the glans, next at the reflected layer of the prepuce, then the glans itself, and, lastly, the body.

It is not commonly met with under forty years of age. It is, however, frequent between this period of life and sixty, and by no means rare in extreme old age. In childhood I am acquainted with but one instance of the disease having been seen—a remarkable case that came under my own observation, and which I shall presently narrate.

Amongst the causes regarded as tending to the development of the disease, the one holding the foremost place is congenital phymosis. The degeneration of long-standing venereal sores has in some instances established it, and I have seen it myself follow the effects of direct external injury.

I entertain no doubt that congenital phymosis, in persons predisposed to cancer, does exercise a very strong developing tendency—an opinion that is much strengthened by the case of J. H., where the most aggravated form of this malformation was attended by the early production of the malady.

J. H., *æt.* 14, a country lad from Nuneaton, was admitted under my care in the Hospital January, 1865, on account of an ulcerated condition of his penis.

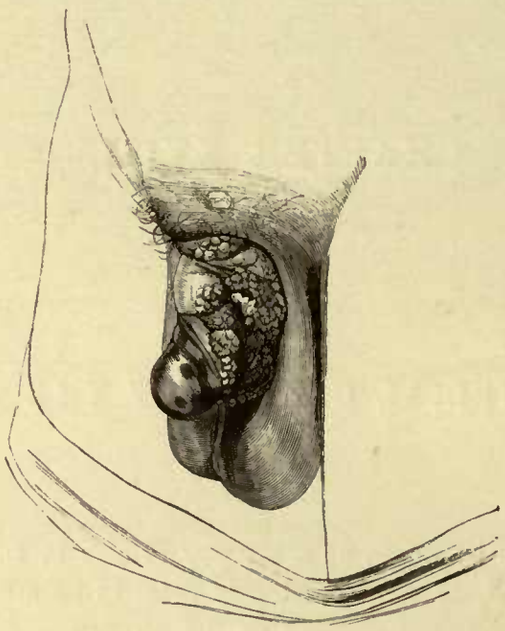
From Mr. Richard B. Nason, of that town, I learned the following particulars: "J. H. was brought to me about three years ago, and the history given me at that time was that, a few months after birth, a brother practitioner was requested to see him, for what I presume, from the father's description, was congenital phymosis. He never could pass urine freely; in the act of micturition the prepuce would bulge out. This took to growing, and when he presented himself to me he had an excrescence, very like a glans penis, through which he passed water, as from the rose of a watering can. I probed each orifice, but failed to find the urethra. There was a hard line along the dorsum of the penis, and a very small tubercular enlargement over the pubis. My impression was, on comparing the hands, that it was early elephantiasis of the prepuce, and which would, in all probability, in time, extend to the scrotum and penis. I sent him to King's College Hospital, under Professor Fergusson, and he removed the hypertrophied mass, and found a natural glans penis behind, and sent him home wonderfully relieved. In spite of the operation, the disease increased, and he went back to London, but received no benefit."

From the father of this patient I gathered very little information beyond that so clearly given by Mr. Nason; but there could be no doubt as to the state of congenital phymosis having been present.

Actual condition.—A stupid, ill-developed boy; but not unhealthy in look. The penis is twisted and thickened, and occupied in most of its body by closely-packed healthy-looking granulations. The

glans is distinct, and only partially affected by similar ulcerations. The pubes, which is covered by a few thin hairs, is very much indurated, and raised over the root of the penis. The inguinal glands on both sides are more distinct and harder than natural. He has no difficulty in passing water.

Fig. 20.



After staying some weeks for observation this patient escaped from the Hospital; and as his parents would not compel his return, I was unable to carry out any operation for his relief. I subsequently learned from Mr. NASON that he died from the effects of exhaustion, December 20th, 1866. Before his death the lad had been a great sufferer, the whole of the external organs being eaten away, and the groins extensively occupied by ulcerations. Cancerous deposits had also softened down on his breast-bone and on one temple.

The inability on the part of any adult to completely expose the glans is a serious consideration in reference not merely to the very certain retention of irritating secretions, but also to the question of the condition, very probably determining the commencement of cancer; it is one, moreover, that, in my judgment, warrants a very strong opinion being given by the surgeon that the inconvenience had better be removed before it becomes the source of the disease. The case of J. P. illustrates the same fact.

J. P., *æt.* 31, married, by occupation a puddler, was admitted under my care in the Hospital October 18th, 1861, on account of an ulcerated condition of his penis.

History.—Is the subject of congenital phymosis. Seven or eight months ago he noticed a hard substance on the right side of the glans, beneath the foreskin. This slowly increased for six months, until he felt it had extended to the upper part of the organ. The surgeon under whose care he was, now slit up his foreskin, and bringing to light the nature of the disease, advised his coming to the Hospital. He states that he has neither had gonorrhœa nor syphilis. There is no history of cancer in his family.

Present condition.—A healthy, vigorous-looking man. The right half of glans penis—its upper part, with the corona—extending also to the reflected layer of the prepuce, are seen to be occupied by a warty growth, partly of a light yellowish colour, but chiefly composed of pinkish granulations, having a vascular character. The base of this growth is very hard, and extends half-way along the body of the penis. The disease is without pain. The inguinal glands are not affected.

October 27th.—I amputated the penis at a distance of one inch from its root.

November 22nd.—Discharged well.

The change of venereal into cancerous sores is, within my observation, a very exceptional circumstance, though doubtless they do become, in some instances, directly the seats of cancerous deposits.

Symptoms.—The first appearance of the disease is often as a small wart or pimple. This, as it grows, gets rubbed or picked off, and a scab forms. Under this begins a sore which slowly spreads but does not penetrate deeply, and has its edges slightly raised, irregular, and hardened. When the disease is concealed by phymosis, and after existing some time is brought to light by an operation on the prepuce, the warty vegetations have in some cases a pinkish colour and are closely and firmly packed together.

As the disease advances the cancerous matters thicken the prepuce. The corpora cavernosa become infiltrated in like manner, and convey an exceedingly dense, hard feel to the fingers. The glans becomes similarly invaded as well as the corpus spongiosum urethræ. The canal of the urethra is frequently penetrated or the meatus is closed, and in either case urinary fistulæ result. Surely and slowly the ulcerating malady spreads; in its course, penis and scrotum disappear, until a mere mass of granulations mark their seat, over which the urine dribbles away from that portion of the urethra that happens to be left.

The glands of the groin may become affected at any time after the commencement of this disease; and, from my own experience, I should say that they are very apt to become enlarged, by sympathetic irritation, at a very early period of its development, no matter in what part of the penis the cancer may be situated. Later, in the course of the disease, they become the seats of cancerous infiltration, and subsequently form wide and destructive ulcerations.

The effects of cancer of the penis are usually confined to that organ, and the glands in direct anatomical relation with it. I have not, myself, in any case observed the manifestation of secondary cancers in the internal organs. The cases of J. E. and J. T., in which the disease was permitted to run its course unchecked by operative interference, are particularly conclusive in strengthening this observation.

J. E., *æt.* 73, a labourer, but now an inmate of the Birmingham Workhouse Infirmary, was brought under my notice by Dr. Robinson, the resident surgeon, in September, 1862.

History.—Two years since a small wart appeared on the upper part of the glans. It did not increase much for twelve months, then ulceration spread, and gradually effected the destruction of the part. He states that he had syphilis twenty years since. The part has never sustained injury, nor has he undergone any operation for the relief of his disease. His family history is good.

Present condition.—A pale, spare, worn, old man. The penis is entirely gone, and at its root is a wide, gaping orifice, bounded above by the pubes, and below and laterally by the remains of the scrotum. At the bottom of the orifice the urine dribbles from the remains of the urethra over the granulations. The general aspect of the sore is healthy, and presents the ordinary appearances belonging to epithelial cancer. The glands in the right groin are hardened. He says that he suffers very little pain.

This patient died in the Infirmary on 2nd November.

Dissection twenty-four hours after death.

No change in the character and extent of the sore had taken place since my first visit. The glands of the right groin were hardened and enlarged, and infiltrated with epithelial cancer.

The bladder was thickened and contracted.

There were no traces of cancerous deposits to be found in any of the internal organs.

J. T., *æt.* 67, an agricultural labourer, but now an inmate of the Birmingham Workhouse Infirmary, was brought under my notice by Dr. Robinson, October 9th, 1862.

History.—Twelve months since, whilst getting in a load of coals, he happened to fall, and in doing so violently bruised the glans penis. A sore formed at the seat of injury, and gradually spread, destroying the parts before it. Never had syphilis, and is unacquainted with any history of cancer in his family. Has had no operation performed for the relief of the disease.

Present condition.—A fine-looking man, with marked cancerous aspect. A wide, gaping aperture marks the site of the root of the penis. This opening presents on its margins and floor abundance of red, healthy-looking granulations, and from a point on the latter the urine discharges itself over the sore.

This patient died in the Infirmary about three months after my visit.

Dissection twenty-four hours after death.

But little change in the external appearances of the disease since my visit. The glands in the right groin were greatly enlarged, and presented, on section, the same appearances as in the previous case. There were no other glands found affected. The bladder was somewhat thickened and contracted. From the right side of the first bone of the sacrum, near to the synchondrosis, there projected outwards, for two inches, a bony growth. This was a simple exostosis, and did not appear to occasion inconvenience to surrounding parts. There were no traces discoverable of any deposits of cancer in any of the internal organs.

The extension of this disease often leads to a fistulous communication with the urethra, but it is remarkable how little the general health suffers in the midst of a great spread of ulcerative action.

J. P., *æt.* 42, married, a small shopkeeper by occupation, was admitted under my care in the Hospital April 27th, 1867.

History.—Twenty years ago had syphilis, followed by sore throat. He is doubtful of the position of the chancre. Eighteen months since, what he terms "a little brown wart" appeared on the right side of the dorsal aspect of the prepuce. He scratched this off, it scabbed over, and he again removed it with his nail, when the spot inflamed and spread by ulceration. Has never undergone any operation, but has been subjected to a variety of medical treatment, especially anti-venereal. He states that he has had no children born alive. There is no history of cancer in his family.

Present condition.—A very healthy-looking man, without wasting. The prepuce on the right side and upper surface of the penis is entirely gone, as well as the whole of the skin covering the dorsum of the penis, leaving its under surface yet covered with healthy integument running into the scrotum, together with a portion of prepuce on the left side. Along the dorsum of the organ the ulceration has penetrated under the skin of the pubes so as to form an arched exit, as it were, for the denuded body of the penis. In this course the disease has formed a smooth sore—just behind the corona glands it has penetrated the urethra, forming an opening of the size of a goose quill, through which almost the whole of the urine escapes. Some parts of the ulceration are red and very healthy-looking, and in many places complete cicatrization has taken place. The discharge is moderate, and the pain of little account. The glans itself is natural, but tucked downwards by the contraction of the sores. The corpora cavernosa are intensely hardened and thickened, and can be felt so as far as their attachment to the rami of the ischium. The glands of the groin are, perhaps, more distinct than usual, but are not otherwise altered.

As I could not advise any operation that would be likely to benefit this patient, I placed him on a good diet, made use of a weak solution of the sulphate of zinc to the sores, and gave him the perchloride of mercury in bark, in doses of one-sixteenth of a grain.

Death ultimately takes place from exhaustion consequent on the continued discharges, and in some cases it is materially hastened by the hæmorrhage which is frequently of a very severe character, more especially when it occurs from the ulcers consequent on the destruction of the lymphatic glands in the groin.

Happily, the disease is attended by scarcely any pain. In its early stages, indeed, by absolutely none at all, and in its later ones by far less than its peculiar locality would seem to suggest, and the very great rapidity of the ulcerative process would render probable.

Diagnosis.—If the characters above given are attended to the surgeon will not be likely to mistake cancer of the penis for any other disease. Cancroid ulcers are occasionally met with in this situation, but their very slow progress, the non-infiltration of the adjacent structures with cancerous matter, and the almost complete immunity of the lymphatic glands, will at once distinguish them from the disease described in this chapter.

Treatment.—The development of cancer in the penis may require the removal of either a part or the whole of the member by the use of the knife. I have not seen, myself, any reason to prefer the use of caustic, and in the majority of cases it is wholly useless.

If the ulceration be of limited extent, and its situation admits of its complete excision so as to leave only healthy parts behind, the partial operation should be preferred. Where, however, the thickening involves the whole of the glans or infiltrates the cavernous bodies, amputation should be performed.

It may be necessary to do this close to the pubes at the root of the organ, or it may suffice at the middle of the body, or, in some instances, immediately behind the glans.

In this operation, simple as it is, there are yet a few points deserving the attention of the practical surgeon. Thus: in proceeding to the removal of the organ, the surgeon, making use of an ordinary catlin, grasps the penis in his left hand, exercising just sufficient stress on the integument at the proposed point of severance as to render it smooth; an assistant should then draw firmly the skin at the root towards the pubes, and a single descent of the knife completes the undertaking. Carried out in this manner, neither too much nor too little skin is obtained to cover

the stump. There is usually free bleeding after the separation is complete, and the arteries of the dorsum as well as those of the corpora cavernosa will require ligature.

For a few days subsequent to the operation it is desirable to leave a catheter in the bladder, as by this means all dribbling of urine over the wound is avoided and the possible adhesion of the lips of the urethra prevented. The loose skin falling around the circle of the catheter speedily unites itself with the surface of the stump, and readily yields to the erections that very frequently are present shortly after this operation has been performed, and which in the presence of a scanty allowance of integument give rise to great suffering.

In some instances considerable inconvenience has resulted from subsequent retraction of the urethral orifice. It will be well for this contingency to be borne in mind, and for the surgeon to take care that the division of the canal is rather in advance of than behind the level of the section of the cavernous bodies.

As a rule where the glands of the groin are involved no operation should be recommended. Cases, however, will present themselves where, despite this implication, it will be highly proper, as a palliative measure, to remove the primary disease in order to escape a very foul and extensive ulceration.

The future of cases of cancer of the penis subjected to operation is not promising, the disease recurring after a comparatively short interval either in the stump or in the adjacent glands. The doubt that attends the very early history of some of these sores should induce patients, without delay, to submit to effective surgical treatment for their relief.

CHAPTER XIX.

EPITHELIAL CANCER OF THE LABIA PUDENDI.

EPITHELIAL cancer of the nymphæ and clitoris is by no means of frequent occurrence; indeed, as compared with the instances of the same disease in the neck of the uterus, it is even rare, and it is by no means as common relatively as it is in the external organs of men.

Its appearance as a primary disease is usually in the form of a small nodule, pimple, or wart, situated on the clitoris or nymphæ or on the labia themselves.

In its further progress it closely imitates the features which mark the extension of similar disease in the scrotum and penis. After a time, in like manner, the glands in the groin become implicated. The ulcerative action spreads from the original centre over the adjacent soft parts. The secondary affection of the glands form vast additional sores, and the patient succumbs to the same series of irremediable conditions that constantly attend on this variety of cancer in other parts.

In some cases it assumes from the first rather a tendency to increase by warty or tubercular growths which often attain a considerable volume, implicating gradually the whole of the labia and the clitoris itself, and breaking out into ulcerations having the characteristics of the cancer sore.

Of its cause nothing is known; and certainly syphilis, which might be thought to predispose to its development, does not appear to influence its origin.

In reference to age, I believe it to be most commonly met with at the middle period of life; in my own experience I have not seen it after fifty years of age nor under twenty.

At its earliest stage it is attended by little inconvenience—at most, some itching or smarting; but later, its extension gives rise to great suffering aggravated by the contact of the urinary and menstrual discharges.

E. K., *æt.* 30, a worn, anxious-looking woman, from Tamworth, was admitted under my care in the Hospital March 2nd, 1859.

History.—She has been married seven and a half years, and has had two children. She always enjoyed good health until about twelve months ago, when a small lump appeared on the inner aspect of the left labium externum which gave rise to continued itching, but did not occasion much suffering until the last three months, when pain of a shooting character, at times intense, became established.

In December, 1858, Mr. SHARPLES, of Tamworth, removed the growth by the knife, and thus writes to me as to his impressions of its nature: "At the time I removed the tumour from E. K., I was impressed with the idea that it was not of a malignant character; I, therefore, did not take any particular notice of it, further than by cutting through it after its removal. The growth was of the size of a horse bean, soft, and without any feeling of elasticity.

The wound soon healed; and she felt no more of it for about a month, when the shooting pain

again returned, and the cicatrix in a short time became excoriated. The pain has been getting more severe and continuous ever since.

The left labium externum, on its internal aspect, is entirely occupied by a hard, ulcerated, flattened growth, composed of abundant very small, highly vascular, and sensitive granulations. The outer surface of the labium is unaffected, and can be easily moved from the cellular connexion between it and its inner wall. The hardness is circumscribed, and limited almost entirely to the mucous surface of the labium.

There are no glands enlarged in the vicinity.

March 16th.—I carefully extirpated the diseased part by means of a free elliptical incision. The hæmorrhage was considerable.

April 3rd.—Wound granulating healthily. A small hard gland discovered in right groin.

The wound entirely healed, and she was made an out-patient at the end of the month, her health being well restored.

July 11th.—She came for examination. The cicatrix is free from return. In the clitoris there is a hard moveable nodule, and in the groins on either side the glands are forming large hard tumours.

Mr. Sharples informs me of the further history of this case: "During the summer the disease made extensive progress. Ulceration extended into both groins, stretching on the left side above the spine of the ilium and penetrating the abdominal wall. A fortnight before her death the fæces passed entirely through this opening. The vulva was completely destroyed, and there was ulceration to some extent about the anus. She died 10th April, 1860. There was no post mortem examination."

The following case affords a very remarkable instance of the manner in which a fatal termination is brought about by the secondary affection of the adjacent glands.

E. F., a married woman, *æt.* 45, from Netherton, was admitted under my care in the Hospital April 25th, 1867.

History.—Was in good health until rather more than two years ago, when after a confinement, followed by a profuse loss of blood, she was left in an exceedingly weak condition. It was soon after this that she observed the labia to become swollen, and also discovered a sore situated on one of the nymphæ. At the time the sore was asserted to be a chancre by her medical attendant, the patient, herself, denying it as "impossible," to use her own word. From this time the swelling and ulceration of the labia have continued to increase, and during the last six months her general health has been seriously affected.

Present condition.—A very worn, cachectic-looking woman. The labia majora, the nymphæ, and clitoris are considerably enlarged, and occupied by granulations of a warty character. In many places their surfaces present ulcerations, with irregular hardened edges. The entire structures are exceedingly hard. The glands in the groin on either side are enlarged. The vagina and uterus are natural. She complains of a severe pain of a gnawing character in the region of the disease and in the back, and has great suffering in micturition. Two days after admission, whilst getting out of bed, she was suddenly seized with an acute pain at the lower part of her abdomen. Shortly after, vomiting came on, together with the most complete collapse (coldness—cadaveric expression of face), and was followed by the most intense pain over the iliac regions. She never rallied from this state, but died twenty-one hours after she was first seized with the pain in the abdomen.

Dissection twenty-four hours after death.—There was enlargement of all the lumbar, sacral, and inguinal glands—having all the physical and microscopical characters of epithelial cancer. One cancerous gland close to the common iliac vein of the right side had broken up and suppurated, and had made way through into the peritoneal cavity by a stellate opening about the size of a crow quill. The cavity of the abscess which was thus formed must have contained about two drachms of pus, and was situated in the pelvic pouch of the peritoneum. The peritoneum generally was intensely congested. The internal organs were quite healthy. The microscopic characters of the growth were such as to put any doubt aside as to its nature.

Diagnosis.—The sole disease with which I am acquainted that is likely to be mistaken for the affection described in this chapter is lupus of the vulva. This disease always commences in the skin, which becomes considerably hypertrophied and materially altered in its structure and appearance before ulceration commences in it. The ulcer extends slowly, is attended with comparatively little pain, and the neighbouring lymphatic glands seldom become affected until the end of life, and then only from sympathetic irritation.

Treatment.—The only plan to be adopted is widely and deeply to excise the first appearance of the disease. Whatever doubt may exist as to the cancerous nature of a limited growth, in an early stage, situated in these parts, that doubt should be given in favour of a complete removal by the knife, as by such a measure a return of the disorder may be prevented. In cases where the parts are more extensively involved it may be desirable to carry out a more serious proceeding, such

as the removal of the entire clitoris with the nymphæ. In such instances care should be taken to clear away all indurated parts; and with this object the lining membrane just within the vagina should be carefully examined as well as the folds of the skin at the anus.

In no case should an operation be recommended where the glands are enlarged, save when the chief object of the operation is the temporary removal of an offensive and distressing sore.

The tendency of this disease is to return after operation at or near to the seat of the primary formation. If the general conditions are not such as to preclude a second excision, it should again be removed, and so on until the state of the glands or the extent of the ulceration prevent further interference.

I know of no general treatment that can avail in these cases beyond that which is usually followed in all such exhausting disorders; but regarding the circumstances of periodical irritation to which these parts are exposed from the contact of the uterine and vaginal discharges, it will behove the surgeon to insist on the most absolute attention to cleanliness on the part of any patient who has undergone an operation.

CHAPTER XX.

EPITHELIAL GROWTHS FOLLOWING MOLES AND WARTS.

IN the chapter on melanosis I have pointed out the tendency of that form of cancerous disease to make its first appearance "near to a congenital mole or wart," some of the best marked examples of epithelial cancer take origin in or near to similar marks or growths.

The cause of this is unknown, and can only in any way be explained by the supposition that persons predisposed to cancer, and the subjects at the same time of such congenital deviations from the natural arrangements of the skin, are more liable to its development where these are situated than in other parts of the general surface.

Any change, then, in the aspect or feeling of one of these moles or warts, that perhaps has existed unaltered for years, should, in the knowledge of the above fact, at once demand the attention of the patient. In numberless instances they accompany their possessors to the grave, without having caused a thought to be bestowed on them; but in others, the alterations they may unexpectedly assume will necessitate the speedy interference of the surgeon.

It is said to be very rare to find pigmentary moles determining the locality for the appearance of epithelial cancer, as compared with the frequency with which warts are charged with a similar liability.

Like epithelial cancers in special parts of the body, the glands in direct relation with the region where these moles have undergone degeneration sooner or later become contaminated, and in some instances form large swellings.

When a mole commences to change, it is observed generally that the spot where it is situated has become slightly hardened or increased in size, that the ordinary colour of the mole is disappearing, and that on its surface, or near to it, there is a tendency to the production of discharge and very slow ulceration; to these symptoms may be added a sense of itching and slight shooting pains. In some instances an evident growth appears to lift up the surface of the mole, tending in like manner, as time goes on, to the establishment of similar conditions.

The progress of these changes is well illustrated by the case of M. H., in which the mole had undergone such alterations as to lead me to think seriously that a cancerous condition would in all probability be established should the ulceration be left to run its course unchecked. The result has, at the end of four years, been satisfactory.

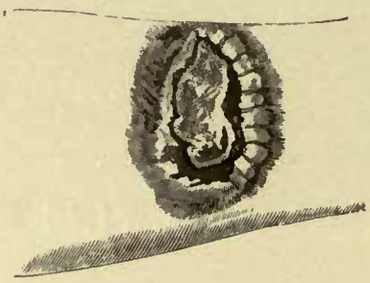
M. H., *æt.* 45, a married woman, of dark complexion, was admitted under my care in the Hospital April 24th, 1863.

History.—From birth has had several moles about the body: one on the upper lip, of a dark brown colour, with hairs growing in it; and another of a similar character, the subject of her present application,

situated about the middle of the left forearm. About four years ago the skin began to ulcerate around the edge of the mole, leaving it untouched. This sore gradually spread at the margins, whilst in its centre it oftentimes healed over with a light pinkish-coloured cicatrix. Sometimes the extension of ulceration would altogether cease for a month or two, and the healing process would almost be complete, and then it would suddenly break out afresh without any assignable cause. There is no special history about herself or her family.

Present condition.—(*Fig.* 21.) An irregular-shaped ulceration surrounds the seat of the mole on the forearm, measuring two inches in its largest diameter. The skin in the centre, an inch long, is entire, and that around the outside of the ulceration is elevated, dark-coloured, and indurated. The surface of the ulcer is mostly clean and red, occasionally greyish in colour. There are no glands enlarged.

Fig. 21.



April 29th.—By her own desire I completely excised the affected part, including in my dissection the portion of skin containing the mole, as well as the ring of ulceration and a very free margin of the surrounding integuments, and passing deep enough to lay bare the muscles beneath.

The wound healed slowly, and she was discharged, with the cicatrix sound, at the end of a month.

June, 1867.—This patient remains well.

In the case of a wart becoming the seat of the disease, very much the same series of steps may be noted to exist as have already been described as leading to the development of epithelial cancer in the lip—the formation and removal of a scab on the wart's surface by a thoughtless scratch, and the gradual formation of a sore.

In the instance of R. W., this mode of origin was especially marked. His case is also interesting as affording an illustration of the disease recurring in the lip after an interval of freedom of between five and six years.

R. W., *æt.* 60, labourer, was admitted under my care in the Hospital June 4th, 1855, on account of a sore situated at the upper part of his back.

History.—About two years since he found a small wart on the skin, between the left shoulder blade and the backbone. He scratched it and pulled the head away repeatedly. During twelve months it gradually increased in size so as to be as large as a walnut, when he had it cut and cauterized. It grew more rapidly after this, and, at last, discharged so much and occasioned such an amount of smarting pain that he came to the Hospital. There is no history of cancer in his family.

Present condition.—Spare, healthy-looking. Lying on the skin of back, on a level with the spine of the scapula, is an irregular-shaped ulceration, measuring about four inches in its widest diameter. The edges of this are raised and hardened, whilst the surface is composed of granulations, very much on a level throughout, in places bright red and healthy, in others covered by a yellow lymph (*Fig.* 22). The axillary glands are not enlarged.

Fig. 22.

June 9th.—Completely excised the part, freely removing the surrounding skin and laying bare the muscles of the region beneath. The disease, on examination, afforded the well-marked characters of epithelial growths. The wound healed in a few weeks, and he left the Hospital well.

This patient came to me again, December 3rd, 1860. The cicatrix, marking the seat of operation, was sound. About four months since he noticed the appearance of several small pimples, situated in various parts of his body. One of these on the nose was larger than the rest; but the chief one formed on the right side of the upper lip, and speedily ulcerated and became painful.

As this sore on the lip had all the character of an ordinary epithelial growth I excised it. The wound healed and I lost sight of him afterwards.

The treatment necessary for these degenerated structures, is free extirpation by the knife. I have seen the most lamentable results attend the use of caustics, and internal remedies can be of no service.

Not only, where practicable, should a free breadth of skin be removed with the disease, but it is desirable also to take away a corresponding amount of the fascia beneath.

The tendency will often be observed for the disease to recur in the cicatrix or near to it. It should again be removed, as the prospect, of future immunity, in the absence of glandular affection, is found by observation to be by no means so unfavourable as might be expected from the recurrence.

The experience I have obtained in dealing with this variety of epithelial cancers leads me to believe that where patients have early submitted to complete excision they may subsequently enjoy the prospect of many years during which there will be no return of the disease. These "many years" may, I also firmly believe, in certain cases, be supplemented by the assurance that it may never be reproduced at all. From all which it follows that the surgeon in discussing the propriety of an operation, can speak with a confidence here, that he must withdraw when measuring the probable future of similar disease in the lip, the penis, the scrotum, and the vulva. We have only to peruse the cases to be satisfied that epithelial cancer does assume far more intensity of malignant action when situated in some regions of the body, as compared with that which it displays in others.

Where the disease is situated on an extremity and is of such an extent as to justify amputation of the limb, this proceeding should be carried out within such distance from its seat as to secure the patient from the least probability of any of the local manifestation being left.

I amputated the forearm in the following instance, where the appearance of the disease and the comparative rapidity of growth would have led me to anticipate scarcely so favourable a result as that which I now record.

J. L., *æt.* 54, single, a brewer by occupation, and of intemperate habits, was admitted under my care in the Hospital September 2nd, 1858, on account of a long standing ulceration of the right hand.

The disease had been growing for two years, having originated in a wart that had been present from his birth, near to the metacarpo-phalangeal articulation of the index finger on the back of the hand. This he injured by contusion several times, so that at length a permanent sore became established. For seven months he had been a patient at the Queen's Hospital. Many times during his attendance there the parts were cauterized, but the knife was not used. The history of his family is without any tendency to disease.

The ulceration is confined chiefly to the entire dorsum of the index finger and the base of the middle one. It fills up the interval between the index finger and thumb, and almost encircles the former, stretching as far forwards on the palmar surface as the middle phalanx (*Fig.* 23).

The integument covering the dorsum of the hand is thickened, and a mass of ulceration is situated at the base of the thumb and middle finger. The articulation between the metacarpal bone of the index finger, and also between the first and second phalanges, is destroyed, and the finger dislocated backwards.

The granulations are dirty and indolent; they do not bleed nor occasion pain, nor are they much elevated above the surrounding parts.

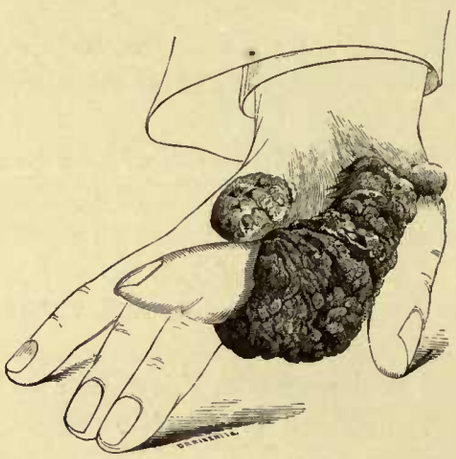
September 7th.—I amputated the limb in the middle third of the forearm.

October 21st.—He was made an out-patient. The stump was tardy in healing and formed several abscesses. Some few weeks after his discharge it was quite sound, and admitted of the fitting of an artificial substitute for his hand. His general health had much improved.

June, 1867.—J. L. is in good health, and obtains his living as doorkeeper at a concert hall.

After the lapse of nearly nine years this patient is without any return of his malady. Would a less complete proceeding have been attended by a similar result? The best answer to give to this question is to express very strongly my conviction that in these cases there can hardly be too vigorous a removal of disease. A mere excision of the affected parts, in the face of the confessedly doubtful degree of malignancy which many of these cases, in their earlier history, possess, cannot as a rule be successful.

Fig. 23.



With this impression I do not hesitate myself to place before a patient the advisability of submitting to as early and complete an operation as practicable, more especially in those cases where the extremities are the localities affected.

I believe that any considerable delay that hinders the treatment of the primary growth, when once it has become painful or is increasing, adds greatly to the probabilities of speedy recurrence after removal. In the case of E. M., which follows, the wart-like growth was unchanged for five years, then for ten it was the seat of pain and slow increase. Within two months after removal it recurred in the cicatrix. The part was now amputated, but the glands became speedily affected, the disease recurred in the limb, and the patient sank in a little over two years afterwards.

E. M., *æt.* 48, single, a laundress, of dark complexion and spare habit, was admitted into the Hospital, in March, 1861, under the care of Mr. Bolton.

History.—Sixteen years ago she noticed a small wart-like growth, about the size of a pin's head, in the cleft between the second and ring fingers of the left hand. It remained the same size for five years, occasionally giving her shooting pain, more especially after being used freely in her occupation. After this it began to grow and continued to increase slowly up to Christmas last, when it had attained the size of a horse bean, and had crept round so as to be situated on the palmar surface of the cleft. During the last ten years the pain in it has been very constant, and of a sharp, shooting character. The investing skin remained quite sound until about a month before coming to the Hospital, when she ran a hook in it, and the sore produced by this accident did not heal. No history of cancer in her family.

In the month of February she came first as an out-patient. In the situation already described and appearing to be intimately attached to the skin was a hard, immoveable swelling of the size of a hazel nut, with a small ulcerated point in its centre. An incision was made into this, but only blood escaped. The incision thus made did not heal, but gradually formed a sore which spread rapidly, the edges becoming everted and hard, the centre excavated, the discharge thin, and the granulations small and compact.

April 3rd.—Having become an in-patient the second finger was amputated at the metacarpal joint, the head and part of shaft of the metacarpal bone being also removed. The wound healed for the most part rapidly, but was not quite sound when she became an out-patient—April 20th. A week or two afterwards the edges of the wound became thickened and everted, assuming the character of the sore for which the finger has been removed (*Fig.* 24).

October 17th.—Was readmitted; the ulceration having been enlarging up to the present time.

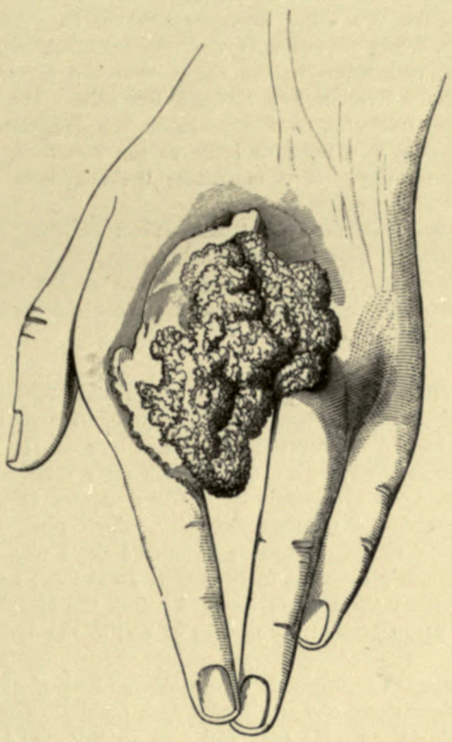
There is now an indolent granulating wound, raised about one-third of an inch from the surrounding skin, an inch and a half broad, extending from the cleft between the index and ring fingers to within an inch of the carpal end of the metacarpal bone on the dorsum of the hand. The ulceration passes

forwards to the palm of the hand, extending for a distance of nearly an inch beyond the cleft; and, indeed, occupies the exact situation of the cicatrix marking the removal of the finger. The skin around is puckered in places, and towards the edges of the sore it is of a bluish tint. She has continual stinging pain in the sore; none in the forearm or axilla. There are no enlarged glands. Has lost flesh since the pain has been so severe. Menstruation has ceased within the last six months.

October 27th.—The forearm was amputated, and the patient was discharged, with the stump healed, November 15th.

I lost sight of this patient for some time afterwards, and did not see her again until July, 1863, when she happened to come to the Hospital as an out-patient on my day of attendance. She looked

Fig. 24.



ill and wasted. Two months after the amputation she found the glands at the inner side of the elbow becoming enlarged. In some few months the skin covering these gave way, and at this present time there is a vast ulcerated surface stretching half way up the arm on the inner side, having all the appearances previously described as belonging to the earlier disease. Shortly after the enlargement and giving way of these glands a solitary tumour—soft, round, and elastic—formed in the cellular membrane beneath the anterior fold of the axilla of the same side. This is now as large as an orange.

E. M., died January 8th, 1864.—At this date, the ulceration extended over the neck, back, and breast. The tumour, after reaching a large size, burst through the skin, and sloughed and bled freely.

The two following cases exemplify the growth of encephaloid cancer in the situation of moles. The distinction between these and epithelial growths in the same situation is sometimes extremely difficult in their earlier stages, but, as the disease progresses, the greater malignancy of encephaloid growths soon manifests itself. The disease very speedily returns in the cicatrix; increases in size with great rapidity, and runs through the various stages which I have previously described when treating of encephaloid disease. Secondary deposits very soon show themselves in various parts of the body and are met with in the viscera after death. The prognosis in any case in which a mole or wart has become the seat of an encephaloid growth is much more unfavourable than it is when they have degenerated into epithelial disease.

W. F., *æt.* 43, a painter by occupation, the father of eight children, a dark-complexioned, spare, but healthy-looking man, came as an out-patient at the General Hospital, in August, 1856, having a growth on the skin near to the left scapula.

From birth he had a dark brown mole situated near the inferior angle of the left scapula. This was very small, and never troubled him until about two years and a half since. At this time he

accidentally bruised it, when it began to increase, and became painful. It attained the size of a crown-piece, when it was excised by Mr. BAKER, of Rugby. The wound healed in about a month, and immediately following the disease reappeared in the cicatrix. After about six months from the excision he came to me at the Hospital. He complained then of feeling weak, and had a flat, irregular mass of about an inch in diameter, of a brownish colour, situated in the cicatrix. This presented the ordinary appearances of a malignant growth, and was removed by means of a ligature, the pedicle being small. The disease dried off and the part remained sound, with the exception of the appearance of two small flattened growths, about as large as peas, of a pinkish colour. There was no history of cancer in his family.

February 4th, 1858.—He was admitted as an in-patient.

About ten months since a hardened tubercle appeared near the seat of operation, and about eight months since a growth appeared in the axilla of the right side.

The cicatrix now presents the two small tubercles referred to. About three inches distant from these is the hardened tubercle, freely moveable in the cellular membrane. Several other tubercles are scattered about in the cellular membrane, in the thigh, over the pectoral muscle on right side, and one in the former situation has a darkish hue through the skin. The hepatic region is fuller than natural, and a feeling of isolated tubercles, rendering the surface irregular, is conveyed to the fingers.

In the axilla, on the left side, is a mass as large as the two fists, situated between the anterior and posterior boundaries of the cavity. It is moveable; the skin over it is unaltered in colour, and at times it is the locality of shooting pains.

There is marked cachexia and feebleness about the patient.

He left the Hospital and died in about two months.

The late Dr. PAXTON, of Rugby, under whose care he was at the time of his death, informed me that many other tubercles formed in the cellular membrane, near the surface of the body.

There was no post mortem examination.

In June, 1863, I was requested by Mr. THOMASON, of Whittall Street, in this town, to visit J. M., *æt.* 67, a tall, thin, pale old man, whose occupation had formerly been that of a maltster.

From his birth there had been a small mole on the skin between the scapulæ, and from this, in the course of time, a warty substance grew, which seven years since commenced to discharge. When Mr. THOMASON first saw him, in the April previously, the warty character of the growth to a certain extent remained, but there was superadded a fungous character, which produced a spongy, ragged surface, bleeding at times and discharging freely. It was as large as a hen's egg, of dark livid colour, especially around its base, which was intimately attached to the skin. In the left axilla were two glands as large as pigeon's eggs, which had formed three years back. Finding the bleeding becoming a serious loss to the patient's strength, Mr. THOMASON excised the growth as well as the darkened base. The wound healed by granulation in six weeks.

Until the end of May he seemed to improve, then a change took place; and when I saw him he was complaining of pain in the epigastrium, and was losing flesh rapidly. The liver was hard and prominent in places, and the right leg œdematous. He sank and died on the 21st July.

The body was examined two days after death.

Thorax.—Contents natural.

Abdomen.—The liver was studded throughout with tubera of encephaloid cancer. The lumbar glands were affected by deposits of a similar character. There were no other organs involved.

The axillary glands presented, on section, a similar appearance to the deposits found in the liver.

The family history of this patient afforded the fact that an uncle had died of cancer of the mouth, beyond this his predecessors had been healthy. J. M. himself had four daughters. Of these, one, *æt.* 43, is at present the subject of scirrhus cancer of both mammæ.* A second, *æt.* 37, has numerous moles about the body, but is healthy, as well as her two remaining sisters.

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* See case of S. T., page 13.

CHAPTER XXI.

EPITHELIAL GROWTHS SUPERVENING ON SCARS.

THE scars that remain after wounds, from whatever source they may have arisen, are sometimes the seats of epithelial cancer. Chronic ulcers originating in either disease or accident, and the intractable sores that result from burns and scalds—sometimes healed, more often not—are likewise apt to develop the disease.

Repeated injuries in the situation of a former wound, and above all the persistence, over many years, of an ulcerated surface of considerable extent, are causes that appear directly to excite the production of the cancer.

The malady pursues the same course and possesses similar features to those that mark the progress of epithelial cancer generally.

When a scar commences the onset of the evil, it may often be noticed at one point to become thinner, a little moisture escapes, and a scab and sore become established. At other times one or more small tubercles raise up the scar, and, breaking through, coalesce to form a kind of warty growth.

On an open sore, where there has simply been for so long a smooth, unhealing surface, granulations spring up in some one spot, and, spreading, gradually cover its entire extent. After a while the ulceration begins to widen, in places to deepen, and the edges become raised and hardened. The periosteum covering bones and the bones themselves are penetrated by the advance of the disease, and, if permitted to run on, the patient is destroyed by the effects produced by the extent of the ulceration as well as by the secondary contamination of the adjacent glands.

One of the most remarkable cases that has occurred to me of the origin of this disease by the repeated injury of an old scar, I now relate.

G. S., *æt.* 58, a labourer, was admitted under my care in the Hospital September 24th, 1860, on account of a long-standing ulcer situated at the upper part of the left leg.

History.—For ten or fifteen years he has had a sore at the upper part of the leg. This came at first from a blow, and healed many times; but, being out at work chiefly in the night time, he repeatedly injured the same part again. About two years since was in Hospital with the sore, which then healed; but, on returning to work, it broke out again, and has continued to spread and deepen ever since; and, latterly, has been the seat of severe pain of an aching character. His family are healthy.

Present state.—A strongly-built, vigorous-looking man. Placed within an inch of the upper margin of the tibia, midway between the tuberosities, is an oval-shaped ulcer, measuring nearly four inches in length by an inch and a half in breadth. The centre of the ulcer is deep, and is formed by the excavated wall of the bone beneath. The borders are irregular in outline, but little elevated above the surrounding parts, which have undergone no change in appearance. The general aspect of the sore is of a dull, reddish tint, and the discharge scanty and thin. The bone does not appear enlarged, and the glands

in the limb are unaffected. He describes the pain he suffers as most severe; and, regarding the length of time the sore has hindered him from pursuing his employment, he begs that the limb may be removed.

Accordingly, September 27th, there being no doubt in my mind as to the permanently intractable, if not malignant character of the ulcer, I performed amputation at the knee-joint, taking a short anterior flap from just over the patella, and a long posterior one from the upper part of the calf of the leg. The patient did well, and was discharged, with a most sound and shapely stump, on December 14th.

On examination the substance of the tibia was found to have disappeared, so as to form a cavity in the compact wall, measuring nearly two inches in length by three-quarters of an inch in depth. Beyond the deposit of a little fresh material, in the shape of osseous stalactites, by the margin of this excavation, the remaining parts of the bone were unchanged. The section of the softer parts of the ulcer was tough and fibrous, and of a greyish colour. No cancerous elements were observed by the microscope.

November 4th, 1861.—G. S. was admitted again under my care, and gave the following account of his condition since his discharge.

Three months after the amputation he wore a socket leg, and walked about with great comfort, the pressure being made wholly at the upper part of the thigh. He did not resume work. When eight months had elapsed he suddenly became the subject of attacks of jumping pain in the stump. These gradually increased in severity—at times being so violent as to cause him to shriek out with pain, and drawing the amputated member violently to a right angle with his body. At first these paroxysms came on occasionally, afterwards every day, and sometimes even lasting for many hours, with intervals of only ten minutes. Shortly before his admission his appetite failed him, and he was frequently sick.

Actual condition.—Emaciated. Cachectic. The stump presents a remarkably bulbous appearance. The integuments covering it are tense and shining, a sensation being conveyed to the fingers of deep fluctuation. Its circumference measures twenty inches, whilst the thigh, a little above, measures only sixteen.

In the groin is a mass as large as an orange, the principal part of which is placed below Poupart's ligament; about this are several smaller tumours, evidently glandular. He thinks these swellings have been growing for nearly six months. The pain, he says, now is so bad that he cannot rest for more than ten minutes at a time. When a spasm seizes him the stump is violently jerked upwards, lifting up the clothes, whilst he himself cries out loudly with agony.

Into the softest part of the stump I passed a grooved needle, releasing a little fluid like synovia. Subsequently, with the view of endeavouring to relieve the pain and tension, I made a free incision on its under and outer side, the result being a copious bleeding from the wound.

The severity of the symptoms changed very little until December 9th, when an immense quantity of bloody fœtid discharge burst through at the seat of the incision. He had no spasms after this; but his strength wasted, and he died on the 17th.

Dissection twenty-four hours after death.

Contents of head natural. Thorax.—A mass of calcareous material at the the apex of either lung—otherwise natural. Abdomen.—An abundant deposit of fat about the mesentery. The liver had the appearance of having undergone fatty degeneration—the other organs natural. The chain of glands extending from three inches below Poupart's ligament to as high as the second lumbar vertebra—in the course of the external iliac vessels—were occupied by deposits of epithelial cancer. Some few glands similarly affected were located in the course of the internal iliac vessels also. The largest of these tumours, placed over Poupart's ligament, had undergone softening in its centre.

On examination the remains of the tumour surrounding the femur presented the appearance of a large oval substance of the size of a man's head. On cutting into it, and sawing through the bone, the latter was seen to be altogether unaffected. The skin covering the mass is likewise unchanged by the ulceration and breaking down of tissue, which has progressed so extensively in its centre. The structures constituting the tumour are so altered in character that they can no longer be distinguished other than as a vast malignant formation, having a curdy nature, and appearing to be held together by slight fibrous tissue. Wherever the periosteum could be traced apart from the tumour it was seen to be like the bone—unaffected.

The observation that secondary epithelial cancers are of very rare occurrence in the internal organs or more distant parts is borne out by the dissection in this instance, where, with the recurrence of the disease in an aggravated degree, the glands only in immediate anatomical relation were found to be affected.

Taking the result of this case into consideration—that eight months after the amputation the disease had recurred in the stump, and that the adjacent glands were most probably affected earlier—I have but small doubt in my mind that the local mischief was not completely removed by the operation. In similar cases I think it would be more prudent to amputate higher up, in the lower third or middle of the thigh. The flaps necessary to cover the stump formed at the knee, though perfectly healthy in appearance, must necessarily have bordered somewhat closely on the disease, so as to have rendered them not altogether free from the possibility of implication.

I enforce, then, here—as I have already done in other chapters—the great importance of carrying out any operation for the relief of epithelial cancer, whether by excision or amputation, at as great a distance as practicable from the primary seat.

The closer this rule is adhered to, the better, I believe, it will be for the patient. Operate thoroughly or leave the malady alone. That there must be doubt in the prognosis of all these cases, I believe no one who has seen many of them will deny; and it must also be admitted that some cases presenting apparently identical physical and even microscopical conditions will evince a greater degree of virulence, in reference to malignancy, than others.

From time to time cases will occur which seem to promise well in their history and appearance, and yet in their subsequent progress will exhibit the intense malignancy observable in the example of G. S. I think such cases are the exception in epithelial cancer having the origin we are speaking of, and that the surgeon is justified in holding out a fair prospect that the disease may never recur. Especially may he do so in instances where amputation is necessitated by the degeneration of the wounds produced by burns. The strongest reason, indeed, exists to adopt amputation at an early period in these cases whenever the certainty of the non-healing of the sore becomes an established fact, as there can exist little doubt but that very many of them are to begin with essentially benign, and only simulate at first that cancerous change that sooner or later they really undergo.

The case which follows illustrates these views, the woodcut (*Fig.* 25) conveying accurately those appearances in the sore which should lead us to interfere.

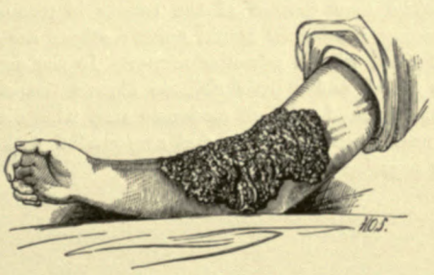
J. P., *æt.* 64, a vigorous-looking old man, was admitted into the General Hospital, under the care of Mr. Crompton, February 24th, 1860.

Fifty-two years since he was severely burned on the neck and anterior aspects of the right arm and forearm. After a long time the wounds healed soundly, leaving an abundant scar from the arm to the forearm, slightly contracting the latter. Family history without taint of cancer. About three years ago the injured limb was severely crushed between two carts, but no external wound was made; at the same time two of his ribs on the right side were broken. Having recovered from the effects of this accident, the cicatrix on the forearm broke into a sore, and slowly increased until it extended over a space measuring five or six inches in circumference.

Thirteen months since he became an in-patient of the Hospital, and in the course of five weeks he was discharged, the sore having almost healed under the application of chloride of zinc.

It subsequently did heal, but broke out again in a few weeks. The ulcerated surface now covers a greater portion of the anterior inner and outer surfaces of the forearm, as well as about three inches of the lower front part of the upper arm (*Fig.* 25).

Fig. 25.



The edges are irregular and raised, and in places overlap the sound parts. The granulations, for the most part, are small and compact, but here and there a larger one is intermingled. They look dull red in colour, and are not highly vascular. The axillary glands are not enlarged.

March 7th.—The limb was removed by amputation through the middle third of upper arm. The stump slowly healed, and he was discharged well April 27th.

Treatment.—If the growth in the scar admits of complete removal, and sufficient healthy textures can be obtained from surrounding parts so as to insure the ready healing of the wound, it may be excised. Care must be taken that the entire thickness of the skin is removed together with the subjacent fascia.

In the cases where this procedure is impracticable and where the disease is situated on the extremities, amputation must be had recourse to. Here it will be desirable, if possible, to remove the limb at such a distance as to insure the absence of all cicatricial tissue in the face of the stump.

In my judgment the action of caustics is still more ineffectual in these cases than in others that I have previously alluded to.

The following case is important in estimating the value of these remarks.

Mrs. H. D., *æt.* 41, married, consulted me December 30th, 1864, on account of a sore on the seat of an old burn scar on the left elbow.

History.—At the age of three years was severely burned, and from that period of life until she was nineteen the wound about the elbow never healed. Having at this age married, and become pregnant, the sore for the first time did heal, and remained sound for nearly twelve years. She then bruised it and it broke out again, and remained open for two months. It again healed, and of its own accord was renewed, since which it has remained open. Of late she has suffered from smarting and jumping pains, especially around the edges. She is the mother of three children, and has always had good health in other respects. There is no history of cancer in her family. She is now getting thinner, and the sore spreads and deepens.

Present state.—A remarkably healthy-looking woman. Forearm permanently tucked by firm burn cicatrices at a right angle. Around the point of the elbow, over a space as large as the spread of the hand, is an ulcerated surface, from the centre of which the olecranon juts out a distance of an inch and a half, the soft parts towards the forearm having receded as their textures have been absorbed. The general surface of the sore is made up of firm pink granulations, whilst the olecranon is covered by purulent-looking lymph. The edges are irregular in outline, and project but little above or beyond the healthy skin. The axillary glands are unaffected.

Feeling satisfied from the appearance of the part, as well as from the history, that the scar had become cancerous, I advised that she should undergo amputation through the upper arm without delay. To this she consented, and the limb was removed, in my presence, through the middle third, on January 24th, 1865, by Mr. Mann, of this town.

Mrs. D. made a good recovery, and is well at this date, June, 1867.

Mr. Charles Bracey furnished me with the following report of the disease. "The skin is absent from as much of the elbow as could be covered by the hand, in place of it is a layer of firm pink granulations. On the outer side this layer is thin, and has a sharp sinuous border, sunk. Below the level of the neighbouring skin, on the inner side, it is thicker, and forms tubercular masses overlying the skin, and strongly resembling epithelial cancer.

"Over the olecranon is a much softer mass, three-quarters of an inch thick, having a striking cerebriform appearance. This reaches to the bone, and is blended with its periosteum to a limited extent—the olecranon being carious, superficially, in its centre. In all other places the deposit is separated from the deep fascia by a moderately-thick layer of healthy fat. The bones are healthy, and so are the joint surfaces, but the articular cartilage of the lower end of the humerus is prolonged forwards, and is somewhat deficient behind, as if the joint had remained flexed for a long time. The forearm appears rather small, but it and the hand are normal in structure.

"*Microscopic examination.*—The firm portion of the cancer is formed of masses of epithelial cells, most of them large, and containing good-sized round nuclei; others are fusiform, and variously shaped, their nuclei being smaller, and filled with a granular matter. In the deeper, softer part of this portion some round and oval cells are found, and a little delicate fibrous tissue. The soft cerebriform matter overlying the olecranon consists of round cells, of moderate size, with distinct nuclei—a few large cells, containing many nuclei—free nuclei lying together and surrounded with granular matter and fusiform cells, with distinct nuclei lying together in masses."

CHAPTER XXII.

RODENT ULCER.

THE affection that I am about to describe in this chapter does not properly fall under the designation of true cancerous or malignant disease, but it possesses so many characters in common with the class of diseases last mentioned, that the diagnosis between them is often a matter of considerable difficulty and doubt; and as a matter of practice we often find that the two diseases are mistaken for each other. Moreover, these rodent ulcers seem to form a natural transition between true cancerous disease on the one hand, and intractable ulcerations of a non-malignant nature, similar to lupus and lupoid ulcerations, on the other, and to be closely allied to both. A description of them will, therefore, not inappropriately form the concluding chapter of this work.

Rodent ulcers most frequently attack the skin of the face—their favourite seat appears to be about the malar bone, or eyelids; they very frequently, however, commence about the alæ of the nose, more rarely they appear, in the first instance, on the ear, and more rarely still on the upper lip. I know of no case in which the lower lip was attacked, except by the extension of the disease, if I exclude the one I have related at page 93; and in that case the disease was not of spontaneous origin, but resulted from a fissure of the lip produced by injury. I am not acquainted with any cases in which an ulcer having all the diagnostic characters of rodent ulcer appeared on any other part of the body than those I have mentioned; but if the case of R. W., related at page 116, be referred to, it will be seen how very closely certain of those intractable ulcers, resulting from the degeneration of some warts, resemble them.

This disease almost invariably commences in the form of an extremely hard tubercle, which generally remains both painless and quiescent for a considerable period, often, indeed, for many years. The only exception that I should make to this statement would be to include those cases in which it may arise from direct injury, as in that of S. K. above referred to. This tubercle at length cracks, and after a time ulcerates; the extension of the ulcer being remarkable more for its extreme slowness than for any other characters. There is but very little discharge from the surface of the ulcer, and what little there is, is generally ichorous rather than purulent, and it is always devoid of that fœtid odour which is so characteristic of cancerous ulcers. Sanguineous discharges occasionally occur from the destruction of some small blood vessels, and occasionally very severe hæmorrhages take place when any considerable artery becomes involved in the destructive process. The margins of these ulcers are extremely hard, elevated, rounded but not everted; they are always irregular and sinuous, as if eaten out here and there; and we frequently find certain small portions of these margins harder than the rest and standing out from them, or as if small indurated masses had been inserted in them. There is, however, no infiltration, other than that due to the ordinary

products of inflammation, in the cutaneous or subcutaneous tissues external to the margin of the ulcer itself. Herein they differ—how greatly the experienced surgeon well knows—from all those ulcers that are of a truly malignant nature. The surface of these ulcers is almost always smooth, but is sometimes covered with small and very vascular granulations, and is very irregular in depth, in some parts being very deep and in others almost superficial. We never find it covered with those irregular and rapidly-increasing growths which sprout over and above the surface of nearly all cancerous ulcers. The progress of the ulcerative action is as surely destructive as is that of cancer itself. It involves and eats away all the tissues and structures lying beneath it; even the bones become softened, absorbed, perforated, and destroyed by it. It lays open the cavities of the nose, antrum, or orbit, according to its seat; or even of two or more of these according to its extent, penetrating sometimes as far as the cavity of the cranium. At times it perforates the eyeballs, the contents of which are discharged and the eye collapses, the miserable patient thus presenting an appearance which is terrible to behold. However long the disease may continue the lymphatic glands do not become affected with any similar disease, nor is there any adventitious product found in them, and it is only very rarely indeed that they undergo even a slight enlargement from the effects of irritation, or of some accidental inflammation attacking the surface of the ulcer. The disease is always a great many years in running its course, varying, I should say, from four or five to ten or twelve; and life is at last destroyed, in the majority of the cases, either by the exhaustion consequent on the continued discharge or by some accidental hæmorrhage. No constitutional cachexia is ever developed during the progress of the disease; on the contrary the patient generally remains in remarkably good health until the last years of his life are near. It seldom, if ever, attacks patients before the middle period of their life is passed. The cases I have recorded in this treatise were respectively aged fifty-three, fifty-six, sixty-two, and seventy-five years; and the older the patient happens to be when the disease attacks him, the slower, I think, does it advance to its inevitable termination. The disease is, in the large majority of cases, remarkably painless throughout its whole course, and no disease of a similar kind is ever met with in any of the viscera.

If the disease be completely removed by the knife it seldom reappears, although it occasionally does so, the reappearance being always limited to the original seat of the disease. I am not acquainted with any case in which the disease after removal reappeared in any other part of the body.

The three following cases exemplify all the points to which I have adverted, and afford very characteristic illustrations of this disease. The case of J. T. is of great interest from its complication with exostosis.

Mrs. B., of Great Bridge, *æt.* 56, was sent to me by Mr. Shirley Palmer, March 3rd, 1859, on account of a destructive ulceration in the neighbourhood of the left orbit.

History.—Ten or eleven years since, noticed a small tumour, situated at the outer angle of the left orbit. This slowly ulcerated, and, spreading to surrounding parts, continued unchecked in its progress to this date. There is no history of cancer in her family.

Present state.—An unhealthy-looking woman, complexion yellow, with wasting and cough. A deep excavated ulcer occupies the left orbital cavity, having completely destroyed its contents. It extends thence along the side of the nose, exposing its passages, and reaching in front as far as the angle of the mouth. It is limited behind by the malar bone. The surface of the sore generally is bright red; it discharges a thin acrid matter, and its edges are winding and elevated. The pain is of a smarting character, by no means severe. There are no glands enlarged. There was evidently nothing to be done for this patient by surgery, and so I advised her simply as to the mode of dressing the sore, and of combating the exhaustive effects of the discharge. She lingered on until the month of September, 1859, the ulceration steadily progressing both in depth and width, when an attack of hæmorrhage hastened the end.

T. G., *æt.* 62, married, a labourer by occupation—a strongly-built, vigorous-looking man—was admitted under my care in the Hospital April 30th, 1858, on account of an ulcer on the right side of the forehead.

History.—Six years ago, after a blow, the disease made its appearance as a small wart-like tubercle, the size of a pea, situated in the skin about two inches above and to the outer side of the right external angular process of the orbit. It gradually increased in size, formed a sore on its most prominent part, and was repeatedly removed either by ligature or caustic during four years. About two years since the

patient first came to the Hospital. I at that time completely excised the growth, it being then as large as a walnut, but it recurred in the cicatrix in three months, and was then destroyed by the chloride of zinc paste; and I did not see him again in the interval between that time and his admission.

Present state.—The ulcerated surface is of oval shape, about an inch and a half long and one inch broad. The edges of this are hard, flattened, and irregular, and project over sound skin. The centre of the sore is filled in with healthy-looking granulations. He suffers continual gnawing pain in the part, with occasional shooting pain at night. There are no enlarged glands, and his family history is satisfactory. I made several attempts to heal the part, after destroying all induration, by the chloride of zinc paste, but to no purpose. I therefore, June 20th, cut out the disease, by laying bare the pericranium and carefully dissecting away all thickened textures, included in the skin, fascia, and muscle above it. After this the wound healed, and he was discharged with it sound on August 13th. October 18th.—Presented himself for examination. There is now a growth in the cicatrix of the size of a florin-piece. It is only slightly elevated above the skin, and does not look unhealthy in character. He complains of lancinating pains around it. In other respects his health is good. January 31st, 1859.—The patient has again been in Hospital for a few weeks. The sore now measures two inches in diameter, is elevated above the surrounding healthy parts, and is acutely painful. Beyond external dressings no treatment advised. June 22nd.—Was readmitted. The orbit and its contents are now covered by the extension of the disease, which has rapidly increased since the last note. Its edges are very markedly elevated and irregular, the sore itself being mainly formed by very vascular granulations, deepening in the centre, where the bone is undergoing removal. There are no glands enlarged (*Fig.* 26).

Fig. 26.

October 3rd, 1859.—Died of exhaustion. Dissection twenty-four hours after death. Body greatly emaciated. The contents of thoracic and abdominal cavities natural.

On examining the glands in the vicinity of the disease they were found unaffected. The portions of the frontal, parietal, and temporal bones corresponding to the situation of the disease were reduced to mere shells, the frontal being perforated to the extent of an inch and a half, without the internal pericranium having given way. The bones, on examination, presented no other change than what appeared to be the result of absorption of their structure. The contents of the cranium were natural.

J. T., *æt.* 53, married, by trade an engineer, a spare, tolerably healthy-looking man, was admitted under my care in the Hospital April 20th, 1857, on account of a large bony tumour of the right thigh, accompanied by the presence of many others of smaller size, situated in various parts of his body, and also because of the appearance of an ulceration on the face.

History.—He states that all the tumours have existed from the date of his birth. Up to the age of twenty-three there was an increase, more or less marked, in all of them. During their growth he suffered pain and numbness in the limbs, where they were chiefly placed, but after their limits appeared to be determined all pain from them ceased. About five years since a small pimple appeared in the skin, over the centre of the right malar bone. This increased until it reached the size of a pea, when a sore formed. Sometimes this scabbed over, and then broke out afresh, throughout gradually increasing in extent, and giving rise to severe lancinating pain. There is nothing remarkable about his family history, beyond the fact that a female child of his own who died at the age of two years and a half had numerous bony nodules growing from her ribs.

Present state.—The right thigh is occupied in its lower and middle thirds by a vast tumour which springs from the femur itself, mainly on its posterior aspect. It is somewhat oval in shape—smooth, and flattened in front, nodulated at the sides and behind. It is without pain, evidently bony in its nature, with the skin unaltered beyond a little thinning. The soft parts of the popliteal space pass to its outer side, being stretched over it. The movements of the knee-joint are limited by its proximity. The tumour, from above downwards, measures twelve inches, its circumference reaching twenty-seven inches. On the same limb are two other bony tumours, nearly symmetrical in shape, and as large as good-sized oranges; they grow respectively from the inner tuberosity of the tibia and the head of the fibula.

On the right humerus, just below the insertion of the pectoralis major, is a small conical tumour, about as large as a filbert. This gave him intense pain during its growth. Similar formations, varying in size from a pea to a walnut, are situated on the lower end of the right ulna—on the lower end of the left ulna—on the seventh rib on either side, just external to its cartilage—on the left tibia and fibula, in situations almost exactly corresponding to those on the right, and also on the internal malleolus.

The sore on the face is about as large as a shilling, being situated on the skin covering the right malar bone, and extending towards the external angular process. The margins of this are irregular, elevated, and hardened, whilst the centre is deep, and covered with granulations of a greyish tint. The bone beneath is thickened, but he is unable to state whether this was the case before the sore commenced. There are no enlarged glands. The general health is good. The patient remained in the Hospital for some months, and I repeatedly destroyed the unhealthy portions of the sore with chloride of zinc paste, but it never healed completely. I recorded my next note of this patient's condition after upwards of twelve months' interval, namely October 11th, 1858, when he came again to the Hospital. The bone-tumours were unchanged, and the general health unimpaired. The sore, however, had extended in depth and circumference, exposing the malar bone, and destroying the outer canthus of the eye (*Fig.* 27).

Fig. 27.

In June, 1859, he was readmitted. For some months past the general health had become affected. He endured severe pain about the face and head. The submaxillary glands were enlarged. The sore occupied the cheek, extending from above the level of the eyebrow to two inches below the angle of the jaw. It spread deeply and widely, and had its edges irregular, raised, and hardened. The progress of the disease could not be arrested, and he died, exhausted, on August 17th, 1859. Dissection. The contents of the head, thorax, and abdomen were natural. The submaxillary and the cervical glands were enlarged. The malar bone had disappeared. The neighbouring bones, namely the frontal, towards the temporal ridge, and the superior maxillary, where it joins the malar, were softened. On section of some of the numerous exostoses the ordinary appearances of healthy, compact bone substance and spongy tissue were observed. The main tumour attached to the femur (Plate xii) afforded a well-marked specimen of nodular exostosis, a thin layer of compact bone being everywhere spread over its uneven surface, whilst its interior was occupied by spongy tissue.

As to the diagnosis of these cases I have nothing to add to what I have already said at page 93.

Treatment.—The only treatment that is of the slightest use in these cases is complete and early removal. This may be effected either by caustic or by the knife. My experience would lead me to discard the former of these altogether; and I would strongly advise that as soon as their nature can be made out satisfactorily, they should be completely and freely excised, and the operation should be repeated again and again if it should return. By this means we may look forward with very great confidence to a complete cure of the disease. By any other means, although we may succeed in healing the ulcer or a portion of it, for a time, yet it is sure to return and to progress with increased rapidity to its certain termination in death.

LIST OF CASES.

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